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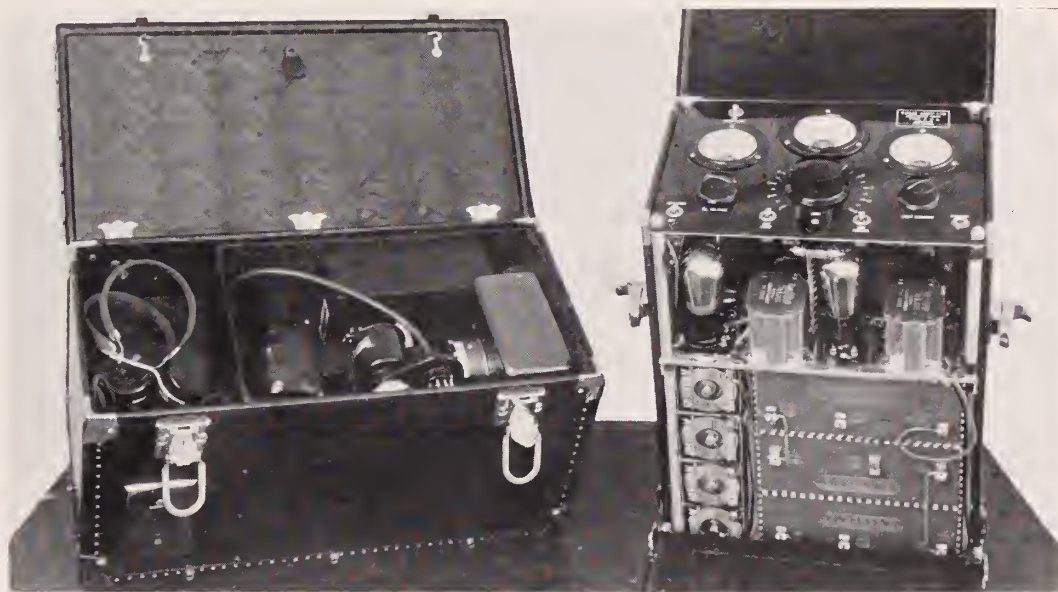
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Cameras

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Screen Definition

by **DR. L. M. DIETERICH**

Consulting Engineer

Part III

CONSIDERING influence of filter use upon definition, we want to dwell at first upon the optical characteristics of the carrier medium for a filter color or tone. Leaving gelatine filters for later consideration, glass as a carrier medium becomes of interest, the more so as its optical characteristics are the same for glass diffusion discs and have not been analyzed in Part II, so prevent repetition.

It may be remarked here that they are also of interest when any glass plate is used in front of the photographic lens as, for example, in blimps.

The optical characteristics are shown in exaggerated relative proportions in Diagram No. 1.

If **O** is the selected object point, it will image at **I** if lens system **L** produces a 1:1 magnification. If glass plate **G** is interposed between object point **O** and lens system **L**, then the sample light rays (six are shown), shown as dotted lines and converging at image point **I** are refracted by glass plate **G** and pass through lens system **L** as shown by full lines. They converge at image point **I'** which is identical to the image of object point **O'**, produced by lens system **L** if there were no glass plate **G** placed in front of the lens **L**. Analysis of this diagram shows that the distance **OO'** and relative distance **II'** increase with the thickness of the glass plate, or in other words, the focal value in general increases with the interposition of a glass plate between the object and the lens system. This increase is not only governed by the conditions above mentioned but results also in a decrease of the depth of focus for a given lens position for the following reason:

A scrutiny of Diagram No. 1 shows, as before mentioned, that for a given power of lens system **L** and a given separation between **G** and **L**, the distance **II'** increases with a decrease of the distance of object point **O**.

The practical results can be most clearly shown when we consider a normally extreme depth of focus which we get when the lens covers at universal focus position a great depth of object field.

For points **O** far distant from the lens, the distance **II'** becomes very small and the circles of confusion controlling out-of-focus effects are not increased.

The closer **O** becomes to the lens, the greater becomes the distance **II'**, the circles of confusion therefore increase and out-of-focus effects become apparent for object distances which are of acceptable focus without the presence of the glass plate.

Analysis of the optical characteristics of the light rays passing through the plate shows, furthermore, (see diagram 2) that a full spectrum white ray is spectrumbized by the glass plate according to the obliquity of the incident ray, the thickness of the glass plate and the refractive index of the glass forming such plate.

We have, therefore, another condition adversely influencing sharp definition by introducing chromatic aberrations which increase the residual aberrations of the well corrected lens system **L**.

The combined results as deduced from above analysis should be known to the cameraman in order to enable him to safeguard the definition results he is striving for.

It is, of course, supposed that the glass plate, be it used as a diffusion disc, a filter base, or a sound proofing element in "blimp" construction, is made of "optical" glass, i. e. with absolute parallel surfaces and of uniform optical material characteristics throughout.

But even under those best glass plate conditions the following facts remain:

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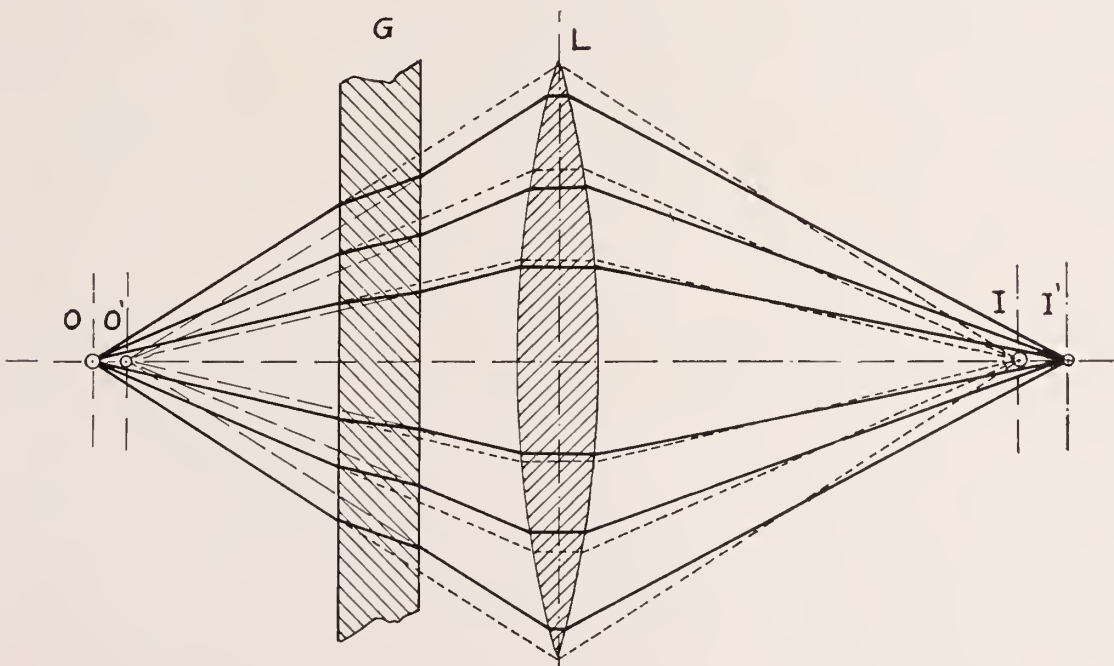


Diagram No. 1

"Versions"

The Problem of Making Foreign-Language Pictures

by **GEOFFREY SHURLOCK**

Supervisor of Foreign Production, Paramount-Publix Studios

PROBABLY the greatest single problem at present confronting the motion picture industry is that of properly serving foreign patrons. Until recently a motion picture—wherever it might be made—had a world audience to play to. The complete standardization of technical equipment made it possible to present a film in any movie theatre in the world. The only change needed to adapt a film to meet the needs of any foreign-language group was the substitution of foreign-language titles for the original English ones.

With the coming of the talking picture, this has changed. Dialogue, no matter how sparingly used, is nevertheless an essential part of the picture, and to adapt a talking picture to foreign consumption, this dialogue must all be in the language understood by the various language-groups. It has been irrefutably proven that foreign-language dialogue cannot be "dubbed" into a picture made in another tongue. Therefore, if today's pictures are to play to the same world-wide audience they formerly entertained, separate versions of the film must be made for each language-group which is to be reached.

This gives rise to many problems, commercial, technical, esthetic, and psychological, which are as yet only half solved. The crux of the situation lies in the fact that the major part of the world's technical resources, both in men and material, is concentrated in Hollywood, while—despite that city's polyglot population—the majority of the outstanding foreign players are found elsewhere. The question therefore is: which group is it most advisable to bring to the location of the other; which arrangement will make for the most efficient production and the most satisfactory working conditions? In other words, which will make the best pictures?

It is a most perplexing problem, and one that will in all probability remain unsettled for a long time to come, for each solution has much in its favor, and much against it.

Viewed commercially, the plan of making all foreign-language pictures at the Hollywood studio has the advantage of speedier production, centralized control, and the availability of the vast technical resources accumulated through more than twenty years of intensive development. On the other hand, these advantages are offset by the considerable expense of importing and maintaining stock companies of actors, directors, and writers in five or six languages, and by the considerably lower costs of production in Europe.

Viewed technically, conditions favor the centering of foreign-language production in Hollywood, for there are found both the most experienced technicians, and the greatest array of modern equipment. On the other hand, equipment may be transported to where the foreign actors are available, and in the major producing centers of Europe—France, England, and Germany—there are enough capable technicians to form, with perhaps the addition of some Hollywood-trained experts, the nucleus of an excellent producing organization.

Viewed esthetically, the question is simply: is the Art of the Talking Picture sufficiently different from the Art of the Silent Picture to demand entirely separate production-treatment in order to appeal to the different language-groups (which formerly were equally receptive to the same silent production), or are the two sufficiently similar so that merely translating the dialogue, as formerly the captions were trans-

lated, will be enough to adapt a screen plot to meet the entertainment needs of the various groups?

Psychologically, the problem is to decide whether the undoubted theoretical advantage of having every person in the company—from the director and star to the meanest assistant-prop-boy—working, speaking and **thinking** in the same language is great enough to be of practical value, or not.

Obviously, there are two equally good answers to each of these questions. Hence, each producing organization is attacking the problem in its own way. Some prefer one method, and some prefer the other. A few are even experimenting with both.

The Paramount-Publix Corporation, for instance, has, after some experimentation determined upon the plan of making the majority of its foreign-language product abroad, except in cases where the star or stars—like Maurice Chevalier, Claudette Colbert, or Marlene Dietrich—is of unusual international popularity, and capable of playing in two or more languages. In such cases, it is obviously best to make such foreign versions at as nearly the same time and place as the English version as is possible. In the majority of cases, however, it has been found best to treat the foreign versions as entirely separate productions, making them abroad, with casts entirely composed of foreign players, and at any time which is convenient.

Spanish pictures, however, may be made in Hollywood, due to the proximity of Mexico and Latin America. These countries not only furnish the necessary players, but also the largest market, which makes it advisable that the Spanish spoken in these versions should be of the Latin-American variety rather than that of Spain, which is not so popular with the people of these countries.

To provide facilities for making all other foreign-language films, however, we have found it advisable to create an entirely new studio near Paris. The majority of existing European studios were found to be inadequate for large-scale production, and since the installation of sound equipment necessitates practically complete rebuilding of a studio, it was decided that the most economical procedure would be the creation of an entirely new film plant. To this end we have erected a complete sound studio at Joinville-sur-Seine. In every respect this plant is new throughout, and represents the most modern production plant in the world, as it embodies the lessons gained during more than twenty years of activity at the firm's New York and Hollywood Studios. Six months ago the site was a wheatfield; today it is a large, modern production plant including nine sound-stages, laboratories, recording-channels, power-plant, administration buildings, carpenter, machine, paint, and other shops, and every other minute detail of a fully-equipped studio. The technical equipment is almost completely American, including such familiar units as Western Electric recording equipment, Mole-Richardson Incandescent lights, Bell & Howell and Mitchell Cameras, Paramount "Blimps," Moviolas, and many other familiar devices. The personnel, on the other hand, is largely European, although many of the department heads, and technical experts are either Americans, or Hollywood-trained Europeans. The executives are all well known in America; the chief being Robert T. Kane, who is well known for his long and distinguished career in this country. His assistant is Richard M. Blumenthal, and the General Manager is

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Machinery or Art in Motion Pictures

by J. TARBOTTON ARMSTRONG

Curator of Motion Picture Museum, University of Southern California

THE MOTION PICTURE is big business, and as such it is operated. The objective of big business is money, and everything is being done by the various companies to outstrip each other in getting more theatres and better equipment. But the theatres and equipment are really for the pictures—not the picture for the theatres and equipment. And besides, with the increase of education, public taste is improving.

The attempt to satisfy the intellect of a ten year old child is disgusting to the better educated portion of the motion picture audience. Likewise the producers forget that children are often the severest critics, and will detect fallacies in story development just as quickly as adults. What is more, the average child of today can understand almost all subtle developments of plot. Even sex is not above the comprehension of many children.

While equipment may be improved, the quality of the average production continues on the same level. The same plots are used over and over. The success of one picture will bring sudden releases of pictures of the same type from every studio. By the time the whole cycle, including quite a few inferior productions, is released, the public will be so tired of that form of picture that the best offering would not have a chance of success for some time to come. It would be far better if the studios would stop this duplication of types of pictures.

The reasons for avoiding duplication from the production standpoint may also be mentioned. In the first place getting a production ready in time to compete with another involves hasty producing. In the second place, it is impossible for all the writers at all the studios to get new ideas for the same topic at the same time. Ideas for stories do not come to order. In the third place, this attempt to imitate will often result in mis-casting, upon the principle that a picture of this type must be produced whether the acting talent be available or not. Much of this sort of thing happened during the recent musical comedy deluge.

There is a false standard of measuring the greatness of a production by the cost. The cost of the picture is often included as an advertising feature. But acting, directing, and photography are arts, and writing is likewise an artistic venture. A picture employing ten characters may be as great as a dramatic achievement, and a greater artistic achievement, than a spectacular production involving an expenditure of a million dollars (and expected to bring back three million).

There will always be some types of pictures involving heavy costs. With these pictures every care should be taken to have the result justify the cost. Mere pageantry will not satisfy the average audience. No matter how complicated the scenes, or how large the supporting cast, the story must be woven around a few main characters—and it must be a story, rather than an excuse for spectacle. Sometimes it is rather hard to keep the two together, but it can be done.

These spectacular productions, however, often come closest to the development of one thing generally missing in the average talking picture. This is rhythm. With the succession of scenes involving massive movements, carefully photographed, some rhythm must result. With poor sound conception and continuity the result, of course, would be not rhythm, but chaos. Likewise the intermingling of trifling dialogue would shatter the rhythm of these big scenes. By this it is certainly not meant that the dialogue writer should give

pioneers, for instance, highly polished lines—but he should avoid lines which contribute nothing to the picture. Spectacular productions must depend a great deal upon rhythm for their success.

But other pictures also demand rhythm, and very few have it. Some may regard rhythm as artificial, but acting is, after all, artificial. No play or motion picture can depict every single incident that might happen in a slice of real life, and most certainly, every speech that might be spoken in reality can not be spoken on the screen.

Voices must be, for the most part, pleasing and harmonious. Every effort must be made to have what happens appear natural, but at the same time, the interest of the audience must be held. Actors should always remember that they are not speaking to a microphone, but to several million people, or rather, that several million people are watching their interpretation of their parts. They must also remember to keep their voices, as well as their bodies, in character. Of course racketeers and similar characters are permitted to have harsh voices, to a certain extent, but even they must speak distinctly.

But keeping voices in rhythm is difficult unless proper dialogue is supplied, and memorized. Much of the dialogue so far has been rather spasmodic. Besides the voices, the various sounds included in a picture must also be kept in rhythm, or the effect upon the audience will be jarring.

Lack of rhythm has been one of the faults with some of the musical productions. Songs were used with ridiculous frequency, and some were often included of such inferior quality that it might have been better to have never released them. While music must have a rhythm, musical comedy is liable to be very lacking in rhythm unless the greatest care is taken. The words of the dialogue must be almost as rhythmical as those of the songs, and both must fit together in a smooth pattern.

There is rhythm even in slapstick. Perhaps it is to rhythm that many favorite comedians owe their popularity. Chaplin, Lloyd, Keaton, and Langdon, all leading comedians, and all depending upon the ridiculous for their popularity, at the same time work with far more perfected rhythm than some of the stars of more serious pictures. All fully realize the value of pantomime, and of slowing up their movements when necessary. And all, while slapstick artists, know how to eliminate excessive action.

Some actors become stars because of their art, but some others become stars because of a type of acting which is not always art, but which the public grows to expect of them. The artist generally remains popular over a period of time, while the type actor loses popularity with unexplained suddenness. Douglas Fairbanks, Mary Pickford, and others remain popular because they are artists as well as actors—because they act—rather than merely take directing they might not understand.

A few well done pictures mean more to the average star or featured player than a large number of mediocre ones. Of course, enough pictures must be made to supply the demand, but even so, more care can be taken with all of them. It is these pictures made to fill the general demand which have the greatest number of faults. The long-run pictures are for the most part of high calibre, but pictures which have but a week or so of big time are often not so great.

(Continued on Page 36)



The Capture and Photographing of *Varanus Komodensis*

by **Philip M. Chancellor, A. S. C., F. R. G. S.**

The accompanying report by Mr. Philip M. Chancellor dealing with the photographing of the almost extinct *Varanus Komodensis*, is one of a series of reports which Mr. Chancellor, a member of the American Society of Cinematographers, will present through this magazine in the coming months. The home of the Komodo Lizard is Flores Island. Mr. Chancellor secured cinematographic records of these reptiles that in years to come should prove priceless to the scientific world.—
Editor's Note.

ONE of the main problems which confronted the expedition was securing permits to collect and to photograph the Komodo Lizard. The Dutch Government very rightly protects the lizard, which is in some danger of becoming extinct. It is such a curiosity that it is greatly in demand for museums and zoological gardens. To the date of writing there have never been any successful cinematographic recordings of the lizard in natural life outside of the sixteen thousand feet which we secured.

The necessary permits being in order, a joint and co-operative expedition was formed for the trip to Flores Island, Chancellor-Stuart Field Museum and the Museum of Buitenzorg, the latter under the capable leadership of Dr. de Jong. There were five white members in the party.

The expedition sailed from Macassar bound for Flores Island in October, 1929. The little island steamer wound through a series of small islands, and arrived at Labuan Badjo

on the third day. Labuan was a small settlement whose main activity was pearling, an industry conducted by an Australian-Dutch concern. Here a few days were spent arranging for carriers and making test shots of the light, which proved to be of a very high actinic quality. We then proceeded into the mountains, the home of the lizard.

Camp was established at a small rest-house sometimes used by the Resident for deer-shooting. The "rest-house" was entirely a bamboo and pandanas affair with three rooms. This, however, did very well as a kitchen, store-room and laboratory. Sleeping was all under the stars. The laboratory consisted of a roughly made table and a box, where a changing bag could be operated easily, both for loading and to make tests in a field test tank.

The natives thereabout had been informed of our coming and had selected likely spots for photographing the animals. The location proved to be a dried-up marsh, surrounded by mountains which practically formed a crater around it. A fallen



Mr. Chancellor in the "blind" photographing the lizards



A beautiful specimen of the Komodo Lizard. (Courtesy of Field Museum of Natural History).

tree made an excellent camera-blind. A problem presented itself immediately. The lizards would not come out in the full sunlight on account of the heat. Oddly enough, exposure to the sun would kill them in about an hour. For this reason filming them was restricted to before eight-thirty in the morning and after five in the afternoon. The light fortunately was particularly strong and the atmosphere free of haze,—quite the reverse of Java. Some of the shots were made with the sun not quite over the rim of the hills, with the subject in shadow.

In the first attempt the lizards were baited to within twelve hundred feet of the camera, but later they were brought to eight hundred feet. An Akeley camera with a 17½" f5.6 Taylor-Hobson Cooke lens was used. Most of the shots were made at f5.6+.

It was fascinating to see the lizards feeding. The bait was a colt which had died in the village. The carcass was staked to the ground with strong lashings to prevent its being carried off. The lizard would dive in up to his shoulders, and then, lifting his head as if in challenge, would gulp down tasty pieces of meat with blood and saliva dripping from his mouth.

Certain noises would not disturb the animal. On one occasion when a feast was going on and there were two big fellows about, I changed four magazines and the slight click of the door did not disturb them in the least. Again by whistling in imitation of a bird to attract their attention, they would start and look about. There had been for some time a supposition that the Varanus was deaf, but evidently it was incorrect. One afternoon a squadron of four Dutch military aeroplanes

flew over, and though I could not see the planes, the drone of the motors was plainly audible to the practically unbroken silence. The two lizards that were at the time feeding also heard it and took to the hills, not to return that day. That was about the last place in the world I would expect to have the day's shooting spoiled by aeroplanes. The Varanus could run with surprising speed, though they seem far too big and sluggish to be able to move at all. They could easily outrun a man, as one was chased before the camera one day. At first he looked puzzled and a bit undecided, but when he started he exercised such force that clods of dry dirt were flying behind him.

In all, thirteen lizards were captured. These were distributed about the world in various museums, three going to Field Museum of Chicago where, at this time of writing, they are being prepared for a group.

The natives caught them by the use of a noose and small hunting dogs. The lizard would stand and attempt to fight the dogs, while some brave soul would pass the noose over its head with the aid of a bamboo pole. After that they would close in, and, grabbing him by the tail, would bind him fast to a pole to which he was securely tied. However, they were so strong that they would work loose, and on several occasions we had to get up at night to make them fast. At Labuan they were put into suitable wooden boxes and so were transported to Buitenzorg where the last time I saw them they were doing well and not minding captivity, tho there is a great question as to how they will live in any foreign country.

(Continued on Page 43)



Two of the huge lizards photographed by Mr. Chancellor.

"Noiseless Recording"

Western Electric System

by **H. C. SILENT**

Development Engineer, Electrical Research Products, Inc.

IT IS common knowledge that, when a sound print of the variable density type is played in a reproducing machine, the volume of the reproduction is low if the print is dark and if a compensating adjustment is not made by turning up the fader. In addition, the ground noise of the film is also low. It has been a problem to take advantage of this latter fact with the former methods of recording because the mere act of printing the sound track dark, while it reduced the ground noise, also reduced the volume of sound from the film. This, of course, was undesirable. In the method of recording which is now being employed, these undesirable effects are overcome by regulating the density of the sound track at the recorder automatically.

It is well-known that there is a particular value of density or transmission of the photographic emulsion which permits of the loudest volume from the film without exceeding the photographic limits of good quality. Deviation from this point is possible without distortion if the volume or percentage modulation applied to the film is reduced. This can be taken advantage of by causing the film to be dark on low volume modulation, and as modulation becomes higher we lighten the film to the point where it has the greatest possible carrying

capacity. If this can be done without distorting the volume of sound reproduced by the film, then we shall have a condition where the ground noise from the film is low during periods of low sound. Thus quiet intervals in the sound will be quiet and the ground noise, even though it rises with the sound, will always be more or less drowned out by the increased sound so that there is an effect of considerably reduced ground noise. In other words there is produced a constant signal to noise ratio in which the signal is always very predominant over the noise, and since noise is most noticeable in the quiet intervals there is a very real reduction in the amount of the ground noise.

There are a number of methods by means of which this variation in the transmission of the film can be effected. If we examine for a moment the light-valve employed in the Western Electric System of Recording, we shall see how one of these methods can be applied. In the past, this system has employed a light-valve in which two ribbons were normally spaced .001" apart. These ribbons were vibrated by the sound currents, moving but a slight distance on weak currents and a considerable distance on loud currents. The strongest currents would just bring the ribbons into contact as they vibrated. The space between them was therefore greater than necessary to

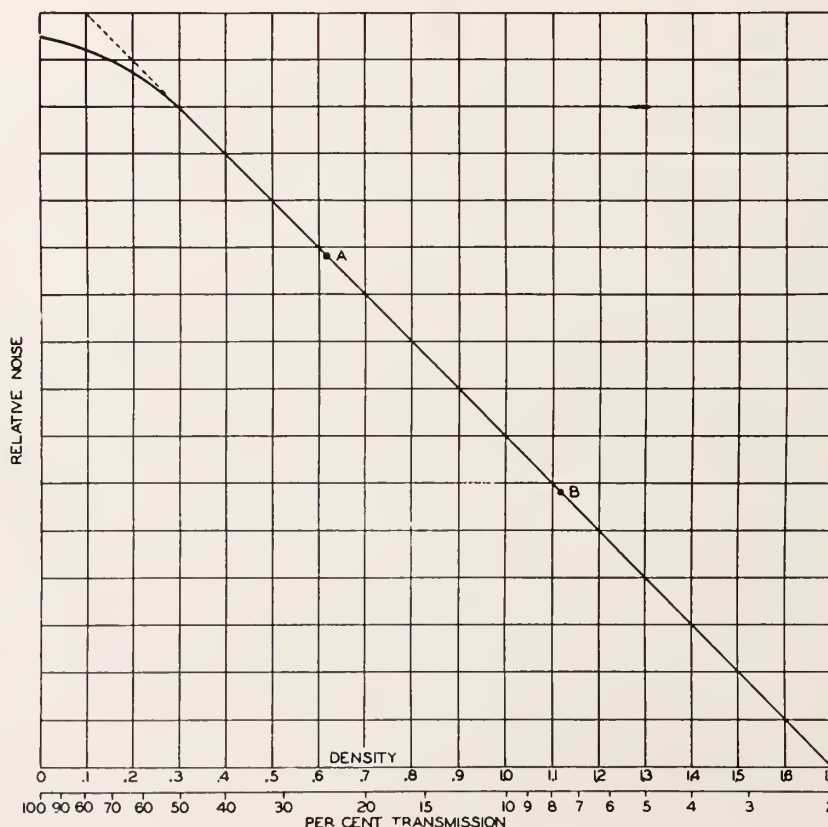


FIGURE 1
Approximate Variation of Reproduced Noise vs. Density of Sound Track.

permit the free vibration of the ribbons on weak currents. A sound track recorded under this method had a constant density corresponding to the one mil spacing between the ribbons and this density was caused to vary with the voice currents but maintained always its constant average.

Under the new system of recording an auxiliary electrical circuit is associated with the light-valve, so that when the sound currents are small and the ribbons need vibrate over but a very small amplitude, they are brought close together and this small vibration almost entirely fills the space between them. Then, as the sound increases in loudness, so that the ribbons are required to vibrate with a greater amplitude, the spacing is automatically increased by the electrical circuit, so that it is always just a little more than sufficient to permit this vibration of the ribbons. This is equivalent to altering the average spacing of the ribbons, so that it is at all times proportional to the envelope of the sound currents. Now, if we regard the amount of light which passes through the average spacing of the ribbons to the film, we find that this light is considerably reduced during moments of silence or of low sounds, which results in a dark sound print. As the ribbons open up for increased sound currents, the amount of light correspondingly increases and a lighter sound print results. Since the actual vibration of the ribbons under the action of the sound currents has been undisturbed in this process, the amount of change of light which reaches the film and in turn the reproducing photoelectric cell has been unaltered even though the total amount of light has been decreased. Since the amount of change of light is unaffected, there is no volume distortion on reproduced sound as a result of this method of recording.

The extent to which the light-valve ribbons may be closed during quiet intervals is necessarily limited. They must not be completely closed, because it is not possible to construct a

device which can instantaneously sample the amplitude of the sound currents and set the ribbons to their proper spacing without introducing expensive delay circuits as auxiliary equipment. Therefore, in setting up the device, the spacing of the ribbons is reduced to something considerably less than their normal spacing but not as far as complete closure. Furthermore, the latitude of the photographic emulsion is not infinite and also limits the extent to which the closure of the ribbons may be effected without exceeding the straight line part of the emulsion characteristic. Since this new method contemplates recording over the same part of the film characteristic, and within the limits of this characteristic previously utilized, there is no change in film technique. The processing which produced the best quality of reproduction with the former method gives the best quality with this new method.

Referring to **Fig. 1**, which is an approximate characteristic of the ground noise obtained from film of various densities, the point A indicates the approximate density employed in normal recording. By shifting the ribbons to have something less than their normal spacing, we can increase the density during the quiet portions of the sound track to point B. This results, then, in a reduction of the noise in the quiet intervals. Then, as the sound currents are applied to the valve, its spacing automatically varies, so that it at all times has sufficient carrying capacity, as represented by the spacing between the ribbons, to carry the applied sound currents. A slight amount of margin is always established as a factor of safety, in order that a sound which builds up suddenly will not clash the ribbons. The manner in which the carrying capacity of the light valve or, in other words, the spacing of the ribbons varies with the applied sound currents is illustrated in **Fig. 2**. It will be seen from this that for weak sound currents below a certain minimum amplitude the ribbon spacing is always the minimum, and the average spacing is unvarying. As the sound currents

(Continued on Page 20)

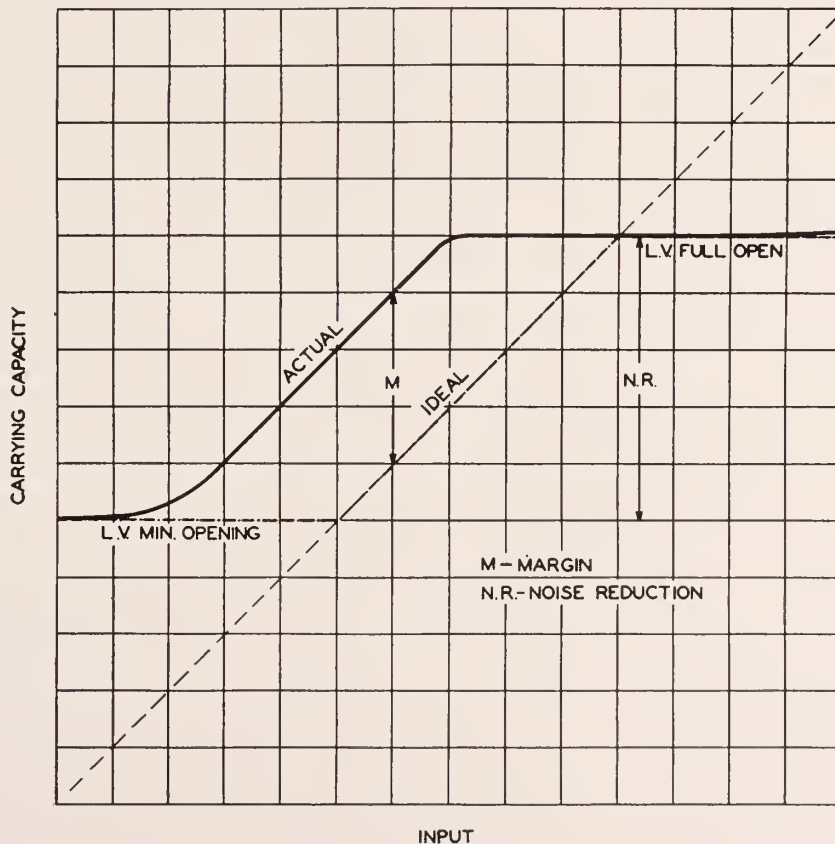


FIGURE 2
Light Valve Carrying Capacity vs. Input.

Standardization of Photo-Electric Cells

by N. R. CAMPBELL

A Communication from the Staff of the Research Laboratories of the General Electric Company, Ltd., Wembley, England.
Courtesy of the Physical and Optical Societies, London

PHOTO-ELECTRIC cells are now regular articles of commerce, but there is a very wide divergence in their manufacture. There are some purposes for which every maker of photo-electric cells offers to provide cells; and yet those made by different makers for the same purpose agree in hardly a single feature. The object of these notes is to suggest that it is desirable that photo-electric cells should be standardized in some respects at least.

Standardization may have two objects. It may seek to fix by convention certain properties of the standardized article, or it may seek to establish some agreed system of describing its properties. The two kinds of standardization are, of course, properly applicable to different kinds of properties. The first kind is applicable to properties that do not affect materially the efficiency of the article or to those that affect it so little that the gain arising from uniformity is greater than the loss arising from standardizing any but the most efficient form. The second kind is applicable to the properties that directly determine efficiency.

In the matter of photo-electric cells there is room for both these kinds of uniformity. A very large proportion of the cells sold at the present time (perhaps 90 per cent.) are used for the reproduction of talking films and for picture telegraphy. The efficiency of cells for these purposes is not affected very greatly by their geometrical form or by the arrangement of their terminals, while any lack of uniformity in this matter makes it impossible to substitute the cells of one maker for those of another; users of cells and, in the long run, all but the least competent makers must suffer from this lack of interchangeability. Here is a clear case for the first kind of standardization. On the other hand, the standardization in this sense of the cathode emission, which is one of the main factors determining the efficiency of the cell, would be disastrous to progress. Here, however, there is room for a standardization of the second kind which would persuade makers to give data of the emission that they offer according to some uniform system, so that the promise of one maker may be directly compared with that of another.

Standard Gas-Filled Cells

Let us start with the first problem and consider, first, size and shape.

Designers of talking-film and picture-telegraphy apparatus like their cells to be small. On the other hand, there is a limit to the size of cells below which they become difficult to make and—possibly this is not exactly the same limit—below which the highest efficiency is unattainable. Maximum dimensions for cells and minimum dimensions for the apparatus to take them should therefore be fixed, preferably in the form of the dimensions of a cylinder enveloping the cell. For the diameter of this cylinder 45 mm. may be suggested. Some existing cells have greater diameters and some existing apparatus smaller diameters; but this appears to be a reasonable compromise between the needs of makers and users.

The length of the cylinder will be determined in part by the terminals and by the optical arrangements. The use of a standard 4-pin valve cap for at least one of the terminals is becoming general; it should be prescribed universally, for it provides the most convenient way of supporting the cell in a fixed position. It is less certain whether both terminals should be connected to separate pins on the same cap. The objection to this plan is insufficient insulation. There is no difficulty in obtaining an insulation resistance of 10 megohms, which is

sufficient when the cell is to be used with rapidly varying lights; for then it is necessary to connect across the cell a resistance of not more than 1 megohm. But cells of this type, though primarily intended for use with such lights, are also suitable for other purposes, which may require an insulation resistance of at least 100 megohms; this is not easily attainable when both leading-in wires are brought out at the same end of the cell into the same cap. However, it may be observed that the leads, even if they are not brought out at the same end of the cell, may be connected to pins on the same cap by means of an exterior wire; this wire can be severed and separate connection made, if higher insulation is required. Accordingly the question may be left to the decision of users. If a second terminal, independent of the valve cap, is used, it should be a screw terminal of standard size, and a convention laid down as to which of the terminals is to be the anode and which the cathode.

The position of the window must now be fixed; by "window" is here meant generally the part of the wall of the cell on which the light should fall so as to strike the cathode in the most appropriate fashion. The centre of the window should be at some standard distance from the bottom of the valve cap and the top of the base into which the pins of the cap fit. 55 mm. may be suggested here; this would bring the centre about 25 mm. above the junction of the valve cap and the glass of the cell; but valve caps differ a little in length. Further the area of the window should be prescribed. So long as all the light enters the window, the efficiency of the cell generally increases somewhat as the area of the window is diminished; hence a minimum area should be prescribed. It is probably sufficient that the cell should use efficiently all the light falling on a circle 15 mm. in diameter.

When these matters are fixed, makers will not differ very widely in the overall length of the cell, although those who prefer the cylindrical form will want more length than those who prefer the spherical. The length of the enveloping cylinder might be fixed at 120 mm. The framework into which the maker will have to fit his cell and for which the user will have to provide in his apparatus will then be that shown in the accompanying figure.

Lastly, there is the anode voltage. Here, at present, there is wide divergence of practice. Some cells on the market cannot be used with voltages as high as 100, others are apparently designed for voltages greater than 300. A low anode voltage presents advantages to the user who has to provide the H. T. supply, but, if it is very low, it necessarily involves some sacrifice of efficiency. Up to a certain limit, increase of anode voltage, and consequent decrease of the pressure of the gas-filling, can be made to give greater magnification, especially under light varying with high frequency. Accordingly it is desirable to fix the standard voltage as high as other considerations permit.

In the circumstances in which cells of the type that we are considering will be used, it is probably necessary to suppose that the cell will be connected permanently to the standard voltage. The cells are liable to be subjected occasionally to very great illuminations, and it is necessary that they should be made so that a glow discharge cannot be maintained in them by this voltage, however great the illumination; that is to say, the standard voltage must be less, not only than the starting voltage of the discharge, but also than its stopping voltage. Since the illumination to which the cells are subjected in

normal use is so small that, if they were to be subjected to no greater illumination, they could be used at voltages approaching very nearly the starting potential in the dark, the limitation thus imposed involves a very considerable sacrifice of output; the current will often not be as much as a quarter of what it might be if the voltage could be adjusted to the illumination. This is probably unavoidable; but makers of cells should aim at making the difference between the starting and stopping potentials as small as possible, and the magnification below the stopping potential as great as possible, so that the sacrifice may be as small as possible. Of course the limitation of the voltage applied to the cells in this particular connection will not prevent users who can work with adjustable voltages using them at full efficiency.

Other Cells

Cells made according to this standard specification would serve for many purposes other than that for which they are primarily intended. But they would not serve all purposes. In the class of gas-filled cells intended for use with white light, very much larger cells are occasionally required (e. g. for television by the scanning-spot method) and also very much smaller cells. Further, there are the distinct classes of vacuum cells intended for accurate measurement and of cells for use with ultra-violet light. But the number of these cells sold is so small and the variety of the purposes to which they are put is so large that it would be unwise to attempt at present any standardization of the first kind.

Specification of Emission

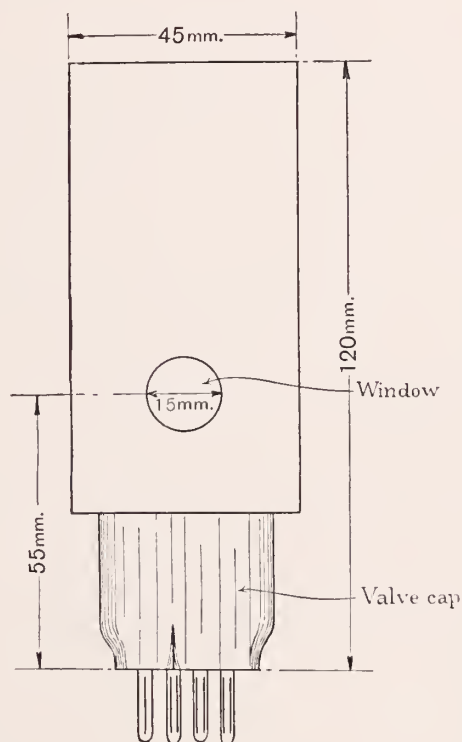
We turn now to standardization of the second kind, that is to say, the prescription of standard methods of stating the properties of cells.

The most important property is the relation of the current through the cell to the illumination. This relation depends, of course, on the nature of the light and the voltage applied to the cell. In vacuum cells the second factor needs no consideration; the voltage for which data are given should be the saturation voltage. Further, since in vacuum cells the current is closely proportional to the illumination, when the nature of the light is constant, the relation should be described by giving the emission, that is to say, the ratio of the saturated current to the rate at which radiation falls on the window. Since this ratio varies somewhat with the mode of incidence of the illumination, perpendicular incidence upon the window of the cell should be specified. There still remains some ambiguity, because the cathode is not always uniform over its surface, and the emission may vary with the part of the window illuminated; the average value should be given, obtained by an illumination uniform over the whole window.

For scientific purposes the most suitable way in which to describe the variation of the emission with the nature of the light is to give a curve relating σ_y and γ , where σ_y is the emission for wave-length γ . But the question of units remains. σ_y is sometimes given in coulombs per calorie, sometimes in coulombs per erg, and sometimes in amperes per watt. The first method has historical priority, but it is less convenient practically than the third, which is, moreover, the method universally adopted for stating thermionic emission.

When cells are to be used with visible light, this is not the best method for practical purposes. The light to which such cells are most often subjected is that from a gas-filled incandescent lamp, and data referred to this light are essential. The color temperature of the tungsten filament may vary from 2600°K. to 3100° K., according to the size and life of the lamp; it would probably be sufficient to take as a standard a single temperature, say 2800° K. The emission for such light should be given in amperes per incident lumen, or per incident watt; lumens are to be preferred, partly because lamps are now usually rated in lumens, partly because, if watts are used, there is liable to be confusion between the watts consumed in the lamp and the watts radiated by it. Further, if a spectral

distribution curve is given (and it is desirable), it should take into account the distribution of energy in the spectrum of this source. A curve giving simply σ_y is misleading, because it fails to take into account the much smaller amount of energy available at the shorter wave-lengths. If such a curve is given for a potassium cell and a caesium-on-silver oxide cell, the maximum of the potassium curve is higher than that of the caesium, and it might be concluded that their emissions under white light were of the same order; actually that of the caesium is much higher, because its maximum lies in a region where far more energy is available. We suggest that the ordi-



nates of the curve should be, not σ_y , but $\sigma_y P_y$, where P_y is proportional to Planck's function for the standard temperature. The area under the curve between two ordinates will then be proportional to the current obtained in response to that part of the radiation from the source which would be isolated by a filter perfectly transparent between these ordinates and opaque elsewhere. The factor of proportionality should be stated by giving the factor by which the product of this area in cm^2 by the incident illumination in lumens (or alternatively in watts) must be multiplied, in order to obtain the current in amperes (or alternatively microamperes). On the other hand, when the emission outside the visible spectrum, and particularly in the ultra-violet, is given, there is no reason to give anything but σ_y ; for the illuminants used vary so greatly in their spectral distribution that this will always have to be taken into account in estimating the current.

Less complete methods of stating the spectral distribution of the sensitivity are also worthy of consideration. Thus there might be given the mean emission for each of a series of wave-length ranges, e.g. 700-600, 600-500, . . . $m\mu$; or the range of wave-length over which the emission does not fall below some prescribed minimum, together with the wave-length for maximum emission; or any of the other alternatives that will suggest themselves. If such methods are adopted, the emission should be given in amperes or microamperes per watt of energy incident on the window.

(Continued on Page 44)

Hal Hall

S A Y S

Happy New Year!

NOW COMES the season of resolutions, most of which we all break within a few weeks. Sometimes we feel that this business of resolving to do this or that, or not to do this or that, is wasted effort. However, if our resolution is good and we stick to it for only a week, our guess is that the world, perhaps, is better for it.

This has been a pretty rough year for a lot of us. The old wolf has howled at many a door, and the bank roll has become thinner than a sheet of Scotch tissue paper—but, it might have been worse. And present indications make us feel that things will be much brighter during the coming year.

As far as the American Cinematographer is concerned, the past year has been unusually kind. Circulation has increased more rapidly than any year in its history. Business has been excellent.

To all of you who have been responsible for this successful year, we extend our heartfelt wish for a Happy and Prosperous 1931.

Costs!

WE KNEW it was coming! This matter of bankers suggesting that negative costs be pared! And now Mr. Harley L. Clarke, President of the Fox organization, makes said suggestion.

Mr. Clarke, being a capable businessman with much experience in finance and public utility management, suggests that a top figure of \$400,000 be set as negative cost. That no picture go beyond that in cost. You see, Mr. Clarke believes in control of manufacturing cost in proportion to earning power. Sound and logical reasoning makes him advance the idea of making pictures with the same idea in mind.

What Mr. Clarke, being a wise businessman, cannot understand is why invest sums from \$1,000,000 to \$3,000,000 in a picture when the potential profit is a dubious factor. Rather good judgment he shows, at that.

Of course, there are a lot of individuals in Hollywood who are beginning to shout that Mr. Clarke is all wrong, or words to that effect. Naturally, for there are a lot of useless heads that would have to drop by the wayside if his idea should be put into practice. If Mr. Clarke's suggestion would do nothing but eliminate some of those useless heads it would be worth while. Everyone connected with the picture business knows that there is a lot of dead wood attached to all the studios. If this were removed and the picture making business placed on a sound business basis there would be better times for those who really contribute to the making of pictures.

This writer has no quarrel with any of the dead wood, but he has often wondered, for example, why when an excellent director is hired to direct a picture, a gentleman called a supervisor has to be paid a big salary to see that the director, who has perhaps forgotten more in an hour than the supervisor has ever known, does his work well.

Perfectly ridiculous it seems, to pay a man to supervise the preparation of a story when said man sometimes cannot speak correct English. But it is done. Maybe Mr. Clarke has been wondering about that angle himself. More money paid to the

technical men who for years have been relegated to the background, less to useless deadwood—that is this writer's suggestion. Then, perhaps, the studios would be able to keep negative costs down.

Some are already saying that entertainment value cannot be placed on the screen at \$400,000 per picture. Well, we bet a plugged nickel that Columbia has been doing it for much less than that, and Columbia has given some good entertainment.

Wide Film

WIDE FILM, which for a time was practically the sole topic of conversation wherever two or more members of the film industry met, apparently has been relegated to the background for some time to come. At least, so it would seem; for now one finds himself being politely but firmly ushered out of any office in which he mentions wide film.

Sex Stuff!

THERE is a certain type of individual who apparently would sell his own soul or his grandmother's dead body for a few nickels. At any rate, that is the impression one sometimes gets when he hears of doings of some producers. I do not mean producers of the better class. I refer to those who duck around the corners when the shooting begins and who dirty up the motion picture bed by their manner of dealing.

Just heard that a film dealing with homo-sexual idea is being put out of State rights. It was shot by a foreign company. Maybe all right for those who have that type of mind that leans to delving into things of that sort. But not for the theatres of America where our wives and families go for recreation, amusement and education. Without a doubt such a subject, exploited properly, would drag in a lot of the morbid morons and bring in a lot of dollars. But such dollars in this writer's opinion are dirty. We of the picture industry have been fighting censorship. It is such tripe that brings it on.

Congratulations

MR. MARTIN QUIGLEY is to be congratulated upon securing Red Kann as editor of Motion Picture Daily, his new daily publication. In Kann he has secured a man who will be a real editor and who will carry with him the respect of the industry. Under his able guidance the paper should prosper. We congratulate Mr. Kann on being associated with Mr. Quigley, also. They are both fortunate.

Greetings

WE take this opportunity of welcoming Gilbert Warrenton, Jr., to Hollywood. The young man, whose father is one of Hollywood's best known cinematographers, arrived December 27, and weighed 7 $\frac{7}{8}$ pounds.

His dad says he will be an A. S. C. man some day. If he is as good a photographer as his dad, we hope so.

An Interview with Lewis Milestone

by HAL HALL

WRITERS cannot grind out excellent stories to order in a period of a few weeks. The weakest link in the motion picture chain is the story. Dialogue in many otherwise good pictures is inane. In some cases it is inexcusably stupid.

Dialogue should be one of the greatest picture assets.

If picture artistry could keep pace with the amazing development made in the technical field of picture making we would soon attain a standard well nigh perfection.

There you have a few pertinent observations from a motion picture director who turned out what the industry has proclaimed the finest picture of the year. Lewis Milestone, director of "All Quiet On the Western Front."

When a man like Milestone speaks he usually says something. He said several mouthfuls when he made the above remarks. A half hour with him and this writer knew fairly well why Milestone is an excellent director—why he makes pictures that are good. In the first place, he talks but little and thinks much. In the second place, he has intestinal fortitude enough to stand upon his own feet and say what he thinks, and then prove he is right by making pictures that are a credit to the motion picture industry.

His slant on talkies is particularly interesting. Since sound swept into the picture business a lot of directors who in the silent days were on top of the pile, have gone by the boards. Sound proved too much for them. This writer has heard many of them wail and lay the blame at the door of sound. But not Mr. Milestone.

"Sound has been the greatest asset that has been handed the director," says Milestone. "This is the way I see it. A man who is deaf and dumb goes into a grocery store and wants some sugar. He has to go through some peculiar motions before he can make the grocer understand what he wants. But overnight he acquires speech. He goes into the store the next morning and says 'Give me five pounds of sugar.' Just like that. Simple, isn't it? Well, that is the case with the picture making and directors. In the old silent days a director had to sweat blood many times to devise a way of putting over a situation. Today with sound someone simply tells it in a few words.

"And that brings me to dialogue," continued Milestone. "You hear a lot of picture people yelling that there is too much dialogue. Well, perhaps they are right—too much dialogue of the kind we have been given in our stories.

"But . . . let me go on record right now with this . . . I maintain that we can hold a screen audience for two hours with a screen play that is filled with conversation just as easily as you can hold them in the theatre of the spoken drama with a play of conversation. However, the dialogue, in conversation, must be scintillating. Scintillating conversation can hold and entertain just as well as action, many times better. Take the plays of Shakespeare for an example. They have come down through the years because of the scintillating conversation. So with the screen play. If an audience in the legitimate theatre can be held for two hours with the brilliant lines of a Shaw, Molnar, Chekhov or a Coward play, the same can be true with the screen. In everyday life we enjoy listening to a brilliant conversation by the hour, but we are bored to tears if the conversation is stupid. So it is with pictures.

"But, sad to relate, most of the dialogue is inane and stupid. But this is not the fault of the writers. I have no quarrel with them. They are to be pitied. Many a magnificent playwright has been brought out here and after being shown to a box of

an office has been given a few weeks in which to turn out a screen play to order. That cannot be done. The ordinary good playwright takes a year to write a play. And that play is not written to order, either. It is a brain-child of the writer. That is why that play will run for perhaps two years in one theatre in New York and continue to run throughout the country. It has a real story and brilliant lines. In short, it was not turned out to order in a few weeks. And as long as writers are given that handicap in the picture business we will have poor dialogue.

"I am not attaching undue importance to dialogue. In 'All Quiet On the Western Front' you will recall that I depended mostly on action and psychological reactions. But when the characters spoke they had real thoughts to utter. Remarque put them there.

"In 'Front Page' which I am doing now I must depend upon dialogue more than action. With the brilliance, virility and humor of the lines, and with the advanced sound technique to use, the responsibility for its success or failure rests upon my own shoulders."

And right there is where Mr. Milestone differs from so many people in the picture industry. He is willing to assume responsibility and stand or fall with his work. No supervisors to tell him what to do. "Today I am freelancing," he says, "because I am determined to produce and direct pictures for which I can be responsible. There can be no set rules for the picturizing of a story. You cannot use factory methods. In my brief career as a director I have enjoyed versatility. Comedy in 'Two Arabian Knights', melodrama in 'The Racket,' tragedy in 'All Quiet On the Western Front,' and now comedy-drama in 'Front Page.' And in 'Front Page' I expect we will have success principally because of the sparkling dialogue written by Charles MacArthur, the author."

And then Milestone turned to the technical end and paid a compliment to cameramen and sound engineers. Throughout the years the cameramen have been steadily advancing in their art, he declares, and now the sound engineers are doing likewise.

"The technicians of the industry," he declares, "have indeed set a pace that will necessitate a terrific effort to follow. During the six months I have been away in Europe such progress has been made in talking picture technique that I am amazed. This progress in technique should prove a real inspiration to all of us. From our directorial, writing and producing points of view, we must strive to take every advantage of the new developments placed at our disposal by these technical geniuses.

"While the technicians have been laboring day and night to perfect sound inventions that make talking pictures possible, not enough attention has been paid to the writing and telling of stories. Our weakest link is the story. That must be improved.

"As I look about me in this industry and see the work that the technical men are doing and have done it makes me proud of the fact that I started in pictures as a technical student, thence to become a film editor. And as a student I shall continue to sit at the feet of the masters."

So, there you have a few real thoughts from a real thinker and doer. There may be many who will disagree with him. There always are in the picture business. But—he insists upon standing upon his own feet, and he has given us something to look upon in "All Quiet On the Western Front." One rather likes taking his hat off to such a man.



Noiseless Recording

(Continued from Page 15)

build up to near their maximum amplitude, it is seen that the average spacing of the ribbons (or their carrying capacity) is gradually increased up to a maximum which corresponds to that of the normal light valve. As the input is further increased, there is no further increase in the ribbon spacing, and clash occurs as in the normal light-valve.

decibels is a very noticeable reduction and permits an extension of the volume range to a point where sound previously completely obscured in ground noise becomes definitely a part of the reproduction with a consequent considerable enhancing of the dramatic effect and naturalness. The practical elimination of this ground noise in the theatre gives to the audience a feeling of being present at the action and a removal of the mechanical from the sound. The average theatre goer's reaction



Figure 3. Noise Reduction Amplifier



Figure 4. Noise Reduction Control Unit

It is entirely possible to continue the carrying capacity of the ribbons upward by allowing their spacing to exceed the normal spacing. No useful purpose is served by this, however, since the carrying capacity of the photographic emulsion would be exceeded by so doing and an effect equivalent to clashing of the light-valve would be obtained. Therefore, the device has been purposely arranged so that photographic overload and light-valve overload occur simultaneously, if the recording lamp has been set for normal recording.

The general principles of noise reduction for sound records on film may be applied to other than the present form of light-valve recorders by making circuit changes as required by the particular type of equipments involved.

Operation of the apparatus employed in this recording system is relatively simple, although considerable time and effort have been spent in its development. The equipment is divided into two units—an amplifier located usually at the location of the main amplifiers and a control unit fed by the amplifier and located at the film recorder. These units are shown in **Fig. 3** and **Fig. 4**. Adjustment of these units is simple and means are provided for checking the adjustments quickly and at fairly frequent intervals.

At the present time commercial recordings are being made with a reduction of ten decibels in the ground noise. It is

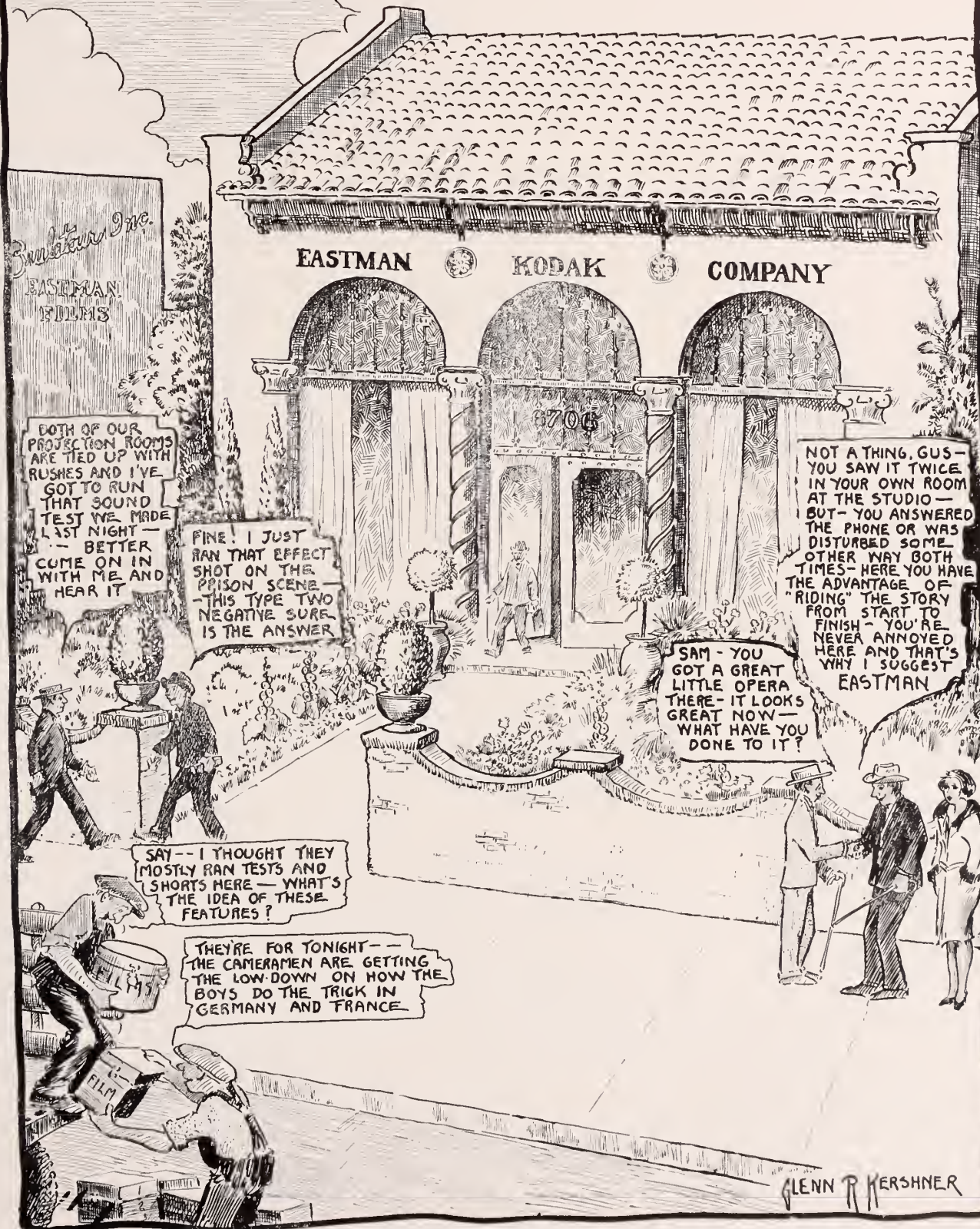
expected that as more experience is gained in the use of this equipment, the noise reduction may be increased. Even ten seems to be one of finding the picture "easy to listen to" and possessing a naturalness which all but places it in the class of "original" instead of "reproduction."

THE ABOVE PAPER was presented at a meeting of the Technicians Branch of the Academy of Motion Picture Arts and Sciences, held at the Universal Studios, Thursday, December 11, 1930. It was accompanied by the presentation of special demonstration reels and a scene from the Paramount picture, "The Right To Love," which was recorded with the noise reduction device described above. This paper was published by the Academy and permission given for reproduction in this magazine. (The Editor).

Fox Newsreel Outfit Going to South Seas

FOX is planning to send a news-reel unit to the South Seas to secure stock shots as well as material for its reel. The trip will occupy about eight months, the party leaving in January.

Eastman Source



BOTH OF OUR PROJECTION ROOMS ARE TIED UP WITH RUSHES AND I'VE GOT TO RUN THAT SOUND TEST WE MADE LAST NIGHT — BETTER COME ON IN WITH ME AND HEAR IT

FINE! I JUST RAN THAT EFFECT SHOT ON THE PRISON SCENE — THIS TYPE TWO NEGATIVE SURE IS THE ANSWER

NOT A THING, GUS — YOU SAW IT TWICE IN YOUR OWN ROOM AT THE STUDIO — BUT — YOU ANSWERED THE PHONE OR WAS DISTURBED SOME OTHER WAY BOTH TIMES — HERE YOU HAVE THE ADVANTAGE OF "RIDING" THE STORY FROM START TO FINISH — YOU'RE NEVER ANNOYED HERE AND THAT'S WHY I SUGGEST EASTMAN

SAM — YOU GOT A GREAT LITTLE OPERA THERE — IT LOOKS GREAT NOW — WHAT HAVE YOU DONE TO IT?

SAY — I THOUGHT THEY MOSTLY RAN TESTS AND SHORTS HERE — WHAT'S THE IDEA OF THESE FEATURES?

THEY'RE FOR TONIGHT — THE CAMERAMEN ARE GETTING THE LOW-DOWN ON HOW THE BOYS DO THE TRICK IN GERMANY AND FRANCE

GLENN R. KERSHNER

"Versions"

(Continued from Page 10)

Fred Bacos, who served in the same capacity with Rex Ingram. Several of the heads of the technical departments are former Hollywood men. Prominent among them are H. V. McAleenan, the Chief Recording Engineer; A. Ellis, the Chief Cutter, and Phil Tannura, the head of the Camera Department. Other former Hollywood Cinematographers now at Joinville are Harry Stradling, Georges Rizard, and Teddy Paull.

With these exceptions, the technical personnel is mainly European. The unanimous opinion of American film people who have travelled in Europe has heretofore been that the reason for the general technical inferiority of European productions has been due not to a lack of expert technicians, but to the lack of sufficient and proper equipment for them to work with. In a recent interview, Ernst Lubitsch recalled the fact that when he made one of his most famous early films in Germany, his lighting equipment consisted of exactly eight lamps, converted from wartime use. Of course, this situation has been more or less improved during the intervening years, but the limitation has still existed. It was the unavoidable result of the infrequent production which, for various reasons, could not be avoided. Yet there were—and are—many trained technicians there, capable of obtaining results of surprising quality even with the limited facilities that existed. Today, with ample technical and financial resources behind them, these men are being given a chance to prove their capability by entering production at an unheard-of scale.

The proportions of this new large-scale production can perhaps be best appreciated when it is recalled that all the studios of France together produced but 67 feature films in 1927, and 94 in 1928, while the 1930 production schedule at the Paramount Joinville plant alone calls for the production of 110 feature pictures and more than fifty short-subjects.

This production is regularly in at least four languages—French, German, Italian, and Swedish, while occasional productions are made in at least ten other tongues. A glance at the production records of the Joinville plant shows that: 20 productions have been made in French; 18 in Spanish; 16 in German; 14 in Swedish; 12 in Italian; 8 in Polish; 6 in Czecho-Slovakian; 7 in Hungarian; 5 in Portuguese; 3 in Roumanian; 2 in Dutch; and one each in Croatian, Norwegian, and Japanese.

The method of making these foreign-language productions has been planned with an eye to removing all possible hazard from production. The English version is first made in the Hollywood or New York studio in the usual manner. When this has been completed and previewed, the response is carefully studied, to determine whether or not the picture is likely to prove sufficient of a success to warrant foreign-language production. If the verdict is favorable, all possible information on the production of this English version is at once forwarded to the Paris plant. A complete script is sent, together with blue-prints and photographs of all the sets, costumes, etc., diagrams of each shot—including placement of lights and microphones—copies of the various production schedules, cost-sheets, etc., and, finally, a print of the completed film. From this pattern, the Paris Studio Staff make the required foreign-language versions. The scripts are translated by expert scenarists who are natives of the countries for which the different versions are intended, and who make whatever minor changes may be necessary in the treatment in order to perfectly please the residents of that particular country. Then the picture is cast, produced and edited in the usual manner.

Each foreign-language company is a complete unit in itself. Each comprises not only a director and cast, but a complete technical crew, and operates as an independent unit. The French unit may start first, to be followed closely by the German one, which, in turn, may be followed by the Swedish or Italian troupe, and so on down the line. The various schedules, however, are arranged so that there is no confusion between the units, and no friction.

By this method, it has been found that each foreign-language version can be made at a minimum production cost, which is as a rule approximately 33 1/3% below the production cost of the American-made, English version of the same film. This saving is due to two main causes. In the first place, salaries and material-costs are appreciably lower in Europe, and in the second place, the expenses of story-preparation, etc., which forms so large a part of both production time and cost, are practically eliminated for the foreign versions.

The question then arises, is all this trouble economically justified? The answer to this is, most emphatically, yes. It must be remembered that in the days of silent films, by far the larger part of the revenue derived from a picture was that derived from the foreign market. This is attested by the fact that a number of independent producers in Hollywood prospered solely on the strength of their foreign releases, having very inferior releasing arrangements in this country, and, in some cases, none at all. That foreign market still exists. Its theatres are still exhibiting pictures, and still demanding films to show. Furthermore, these theatres are, in increasing numbers, being equipped with quality sound-apparatus. Therefore, foreign-language talking-pictures must be made for these theatres. And they must be made to talk the languages which the patrons of these theatres understand. For the last fifteen years these audiences have shown an increasing preference for American pictures. This indicates that American story-material and construction appeal to them. Therefore, the only remaining question is how to give them this type of entertainment, in the form of talking pictures which speak their own language, in the most economical way. And that, in the experience of one of America's oldest and most successful producing firms, is the method outlined above. In this fast-changing industry, it may not be the method of tomorrow, but today it is the most efficient method of providing cinematic entertainment for the millions throughout the world who have by their patronage helped to make the motion picture the institution it is today, and who are, in consequence, entitled to the best in screen entertainment.

Acoustical Engineers Convene in Hollywood

LATEST developments in acoustical research were discussed at a series of meetings held in Hollywood December 12-13 when the Acoustical Society of America met in semi-annual convention with the co-operation of the Technical Bureau of the Academy of M. P. Arts and Sciences. Among the papers relating to the motion picture field were:

"Acoustic Power Levels in Sound Picture Reproduction," by S. K. Wolf and W. J. Sette, Electrical Research Products; "Direct Reading Phase Meter for Audio Frequencies," L. J. Sivian, Bell Telephone Laboratories; "Measurement of Reverberation Time and its Application to Acoustics of Talking Pictures," F. L. Hopper, ERPI; "Problems of Sound Picture Production," M. C. Levee, Paramount Studios; "Sound in the Artistry of Motion Pictures," Lester Cowan, Assistant Secretary of the Academy; "Factors Affecting Quality of Sound Pictures," F. L. Hunt, Bell Laboratories; "Relation of Room Acoustics to Sound Pictures," C. F. Eyring, Bell Laboratories; "Combined Reverberation Time of Recording and Reproducing," A. P. Hill, ERPI; "Power Requirements for Theatres," S. B. Epstein and J. G. Stewart, RCA Photophone.

RCA Photophone to Record Films in India

MADAN THEATRES, LTD., controlling more than 100 theatres in India, Burma and Ceylon, has acquired a complete sound recording unit and seven sound reproducing equipments from R-C-A Photophone, and upon arrival of the sound reproducing apparatus in Calcutta, will begin production of sound pictures for exclusive exhibition in its chain of theatres. F. Madan, director of Madan Theatres, has been in New York for the past two months.

LAST CALL!

**The Boothe Company
Aluminum Contest Ends on**

JANUARY 15TH

\$200.⁰⁰ in Cash Prizes

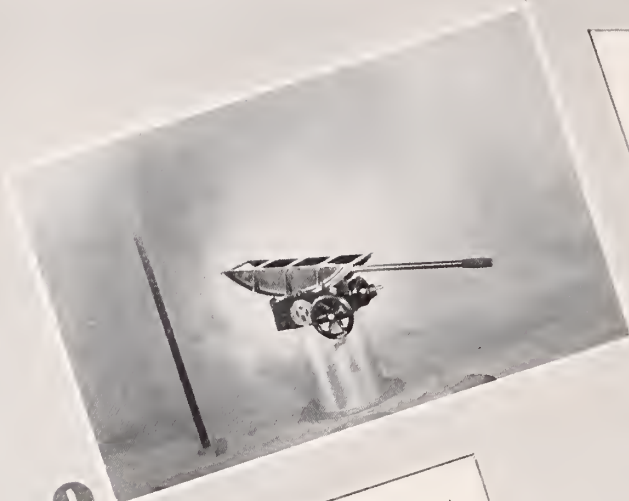
**YOUR Entry Must Be in the Office of the
American Cinematographer by Midnight, January
15th, 1931, to be eligible. SEND IT NOW!**

RULES OF CONTEST

1. The **BOOTHE COMPANY, ALUMINUM MODEL—CASH PRIZE CONTEST** began with October issue of the **AMERICAN CINEMATOGRAPHER** and ends at midnight of January 15th, 1931. Winners' names will be announced in the February number of this magazine. It is not necessary to be a subscriber to this periodical in order to compete.
2. Cash awards of \$100—\$60—and \$40—representing first, second and third prizes will be given by **BOOTHE COMPANY** to the three contestants whose models, in the opinion of the judges are considered best adapted to practical and beneficial use in the production of motion pictures. Contestants, in case of a tie, will receive like awards.
3. Anyone associated with motion picture work may compete—amateurs as well as professionals. This also means all motion picture studio or motion picture theatre employees, or any organization whose products are used in motion picture work, except those in any way associated with the **BOOTHE COMPANY** or any other organization handling aluminum or aluminum alloys.
4. The judges are representatives of various branches of the motion picture industry. Their decision will be final.
5. Two photographs, a front and side view, with a description of the completed product, must be sent to "The **BOOTHE COMPANY ALUMINUM CONTEST** Editor," 1222 Guaranty Building, Hollywood, on or before January 15th, 1931. Be sure that this is accompanied by your name and address. No communications regarding this contest will be answered, unless accompanied by a self-addressed, stamped envelope. In no instance shall entries be sent until such request is made by the judges. Products must be made from aluminum or aluminum alloys. They may be wholly of aluminum or aluminum alloys, or may represent not less than seventy-five percent of these metals by weight. They may represent in their entirety a product useful to the motion picture industry, or may be a part, attachment or accessory to be used on some apparatus, machine or structure now employed.

New Lighting, Electrical and

LOOKING BACK over the year 1930 it is considerable strides toward perfection. This development of various mechanical units in light productions are revealing a continued increase color and many other technical effects. Picturized. This in turn has necessitated the development. The units displayed here, all of which are now stock equipment of, Mole-Richardson, Inc. has been accomplished during the past year. In the years Mole-Richardson has developed scores of mechanical devices of measurable part in the advancement of the industry. Foremost, perhaps, is the development of descent lighting equipment. This is the greatest problem in the production of talkies. One of the Mole-Richardson products is a camera. This company, as well as renting all types of equipment, specializes in lighting set, sound and electrical equipment.



1

1. Tilt Head Mounted on High Hat. This unit permits of operating camera as low as ten inches above the floor. It consists of a base and a set of sectional rings.

2

2. Tilt Head Mounted on low Rolling Tripod. The low rolling tripod is designed for use where it is desired to operate camera from below forty-eight inch lens height.



3. Mole-Richardson Perambulator. This unique device serves to eliminate trouble in changing from travel to stationary shots. It is designed for both occasions.

4. Tilt Head Mounted on standard Rolling Tripod. This tripod supports the camera at a lens height of from 70 1/2 inches high position to 48 1/2 inches low position.

5. Interior View of Mole-Richardson Assemble Room. Here all units are assembled and completed ready for delivery.



6. Mole-Richardson Sky Light. This lamp was developed particularly to illuminate large backings. It eliminates all light circles and dark rings.

7. Exterior View of Mole-Richardson Plant, located at 941 N. Sycamore, in the heart of Hollywood's industrial district.



4



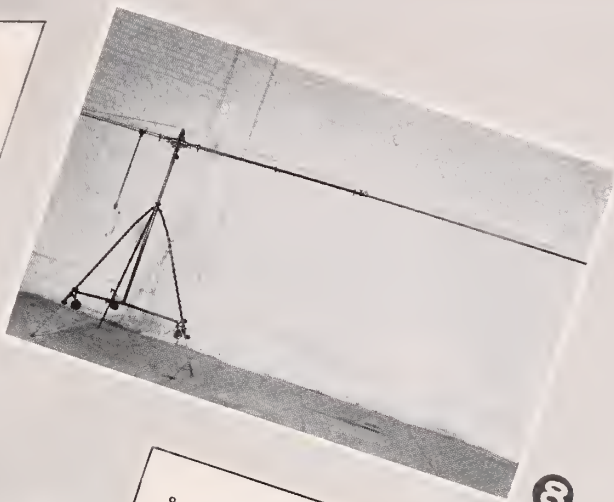
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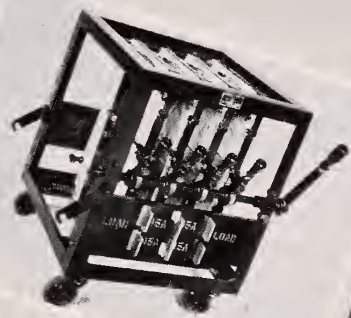
Latest Units Developed During 1930

It is apparent that talking motion pictures have taken a large measure, in a large measure, to the development of lighting, electrical, set and sound equipment. Present developments in this scope, from the standpoint of sound, action, and lighting, today call for treatments heretofore not known. The development of thousands of dollars of new equipment have been perfected and produced by, and are being used by, lighting engineers, are illustrative of what has been contributed and perfected during the last three years which have played an important part in the advancement of sound cinema. The contribution of incandescent lighting equipment which solved one of the most important problems in production at the inception of the most recent Mole-camera perambulator. The development from manufacturing incandescent equipment involving and perfecting electrical pieces.



8

8. Mole-Richardson Type III Microphone Boom. This boom is designed particularly for more efficient use on location. It is much smaller and much lighter in weight than the regular studio Boom.



9

9. Mole-Richardson Dimmer Bank. This unit was designed for dimming circuits of large amperage for producing effects for projecting sun, fadeouts, etc. All units have both individual control or master control.



10

10. Mole-Richardson Microphone Boom for studio use. This instrument greatly simplifies the taking of sound on large sets, eliminating the necessity of placing a plurality of microphones.

11. Factory view in the Mole-Richardson plant. Machine shop where all parts are ground and fashioned from raw material.

12. Mole-Richardson Bowl Lamp. This light was designed particularly to general large sets. The Bowl light is very popular with comedy producers, as they require a high intensity general illumination.



12



11



Screen Definition

(Continued from Page 9)

Interposition of a glass plate between object and lens

1. Makes focusing or re-focusing imperative after glass plate is in fixed position,
2. Glass plate should be placed at right angles to optical axis of lens system,
3. Glass plate should be as close as possible to lens system,
4. Glass plate should be as thin as possible,
5. Refractive index of glass plate material should be as low as possible,
6. Realization of the fact that normal depth of focus is decreased by glass plate, and
7. That these adverse influences are more pronounced for "close ups" than for "distance shots."

These optical facts are, as previously stated, characteristic of filters as well as diffusion discs and, but of less importance, for blimp glass plates.

The practical realization of these facts by the experienced cameraman make him prefer a thin gelatine filter to a thick glass one (leaving permanency of filter value out of consideration) and make him place a diffusion disc as close as possible to the lens.

If the ambitious cameraman mentally absorbs these facts, he will, by judicious observation of them in practical camera operation, find that he can materially improve the pictorial and especially definition results of his "takes."

Having disposed so far of the optical influences of a glass plate as a filter carrier within the unavoidable limits of this article, the chromatic influence of filter means in general upon definition becomes of importance.

Before starting the analysis of this most important and least understood influence, it might be mentioned that there seems sometimes to exist the opinion that the use of a filter adds its specific color value to the object light, whereas, in fact, it

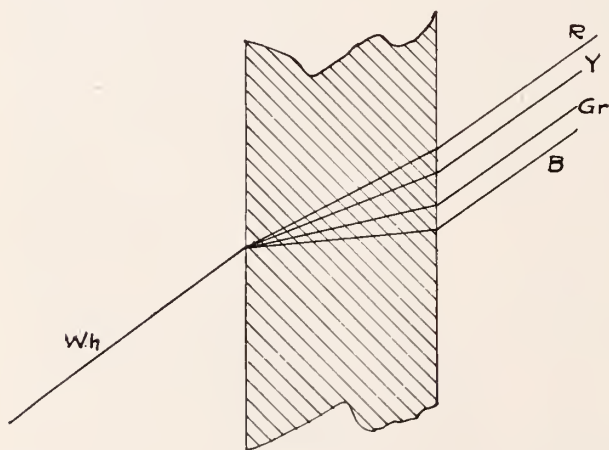


Diagram No. 2

more or less restricts the actinic value of the object light to its specific color value and diminishes the spectrum values outside of its own sphere and that it **always** decreases the speed of the lens.

The proper use of color filters in motion picture photography covers two very important fields.

Firstly, the proper selection and use of color filters is a powerful means to control not only definition but also exposure results for **different** parts of the object field for a **single** exposure, and

Secondly, that the proper selection and use of color filters enables the cameraman not only, as is well known and practiced, to produce interesting and even startling trick effects,

but what is more important, to produce natural effects of surprisingly nature-true characteristics under actual perspective and illumination characteristics of an entirely different composition.

This absorbingly interesting phase of filter use shall be analyzed in Part IV of this series of articles, but a well-balanced series of filters for above mentioned purposes as scientifically developed and practically used by Milton Moore since 1924 is herein given for preliminary study by the reader.

Although this series of filters has been developed and used to the number of twenty, only six of the most important of them are herewith given in an order of decreasing density. They consist of combinations of two Wratten filter numbers each:

- | | |
|---------------------|--------------------------|
| 1. No. 64 and 27. | 4. No. E22 and B58. |
| 2. No. 64 and 23. | 5. No. 23 and B57. |
| 3. No. 23a and B58. | 6. No. E22 and B57 (A3). |

The practical results of their use will be shown in Part IV by comparative test photographs.

Dropping of Multicolor Denied by J. C. Woolf

RUMORS that Multicolor would be abandoned in favor of black and white or abandoned in its entirety are vigorously denied in a statement issued by J. C. Woolf, who is in charge of sales promotion.

"Multicolor is proceeding as fast as is consistent with good business and first class mechanical methods, and will within the space of a few days be in its new home," Woolf stated.

Movies Made on Glass with German Invention

BERLIN—George Greenbaum, German inventor, has developed a device enabling a scene lasting about one minute to be photographed on a 2¼ by 3½ inch dry plate. With the aid of a special projector the picture can be thrown on the screen.

The plate is divided into a large number of small parts, which are exposed one by one in the same way as the sections of a strip of moving picture film. Pictures follow one another in a series of horizontal rows.

Strenges Heads Local 644

THE FOLLOWING officers were elected by Local 644, International Photographers, New York City, for the coming year:

President, Walter Strenges; first vice president, Ulyate K. Whipple; second vice president, Harry Harde; third vice president, Willard Vander Verr; treasurer, Frank Kirby; secretary, Walter A. Lang; sergeant-at-arms, Frank Landi; trustee for a three-year period, William Miller.

The new executive board is composed of the following members: George Folsey, William Steiner, Lawrence Williams, Charles Downs, Lester S. Lang, Ray Foster, George W. Peters, Joseph Seiden, Walter Scott, Herman Lutz, Hugo Johnson, Willard Vander Verr, Tom Hogan, Carl Larsen.

Francis E. Zeisse continues as business agent of the local, which has a registration of 250 members.

450 Service Engineers Now Maintained by ERPI

ELECTRICAL Research Products now has 450 service engineers in 220 localities throughout the U. S. to provide service for the 4,789 Western Electric sound systems in use at present. In New York there are 34 resident engineers, Chicago has 26, Los Angeles 18, Philadelphia 16, Boston 15 and Kansas City 10.

TO THE
Motion Picture Industry

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Happiness and Prosperity



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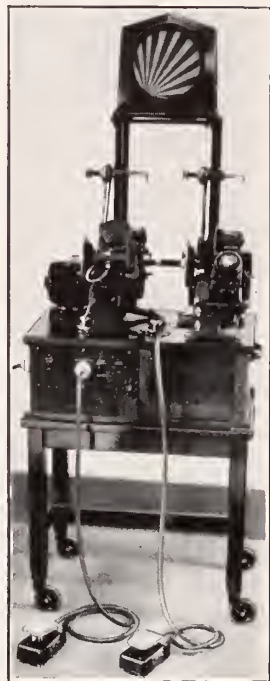
London, England
10 D'Arblay St
Sydney, Australia
No. 4-C Her Majesty's Arcade
Mexico City, Mexico
Paseo de la Reforma 36½
Havana, Cuba
H-130, Vedado
Lima, Peru
Edificia Minería

Johannesburg, So. Africa
Cor. Joubert & Kerk Sts.
Manila, Philippine Islands
No. 39 Escolta St.
Buenos Aires, Argentina
500 Sarmiento
Honolulu, T. H.
720 South St.

Max Factor's
Panchromatic
and
Technicolor
Make-up
for the
Screen

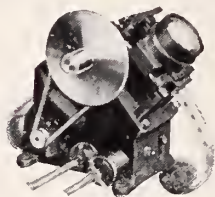
Max Factor's
Theatrical
Make-up
for the
Stage

MOVIOLA



FILM VIEWING AND SOUND REPRODUCING MACHINES FOR USE WITH: SEPARATE PICTURE FILM AND SOUND FILM, COMPOSITE FILM AND SOUND ON DISC RECORD. FOR EDITING 35 MM. FILM, 16 MM. FILM, WIDE FILM.

Write for Circulars Describing the Different Models



MOVIOLA COMPANY

1451 GORDON STREET

HOLLYWOOD, CALIFORNIA

New Portable Talker Set

ASSOCIATED Portable Sound Equipments, Ltd., London, has been registered with a capital of \$55,000, to market a portable sound set, which, it is believed, will be the most inexpensive device of its kind. Actual manufacture of the set, intended primarily for use with advertising films, will begin soon.

Larger London Quarters for W. E.

WESTERN ELECTRIC'S sales branch, headed by T. P. Depew, assisted by C. W. Le Grand, has taken more spacious quarters on the Aldwych floor of the Bush House.

Two Bray Travel Units Going Out Next Year

J. R. BRAY will dispatch a crew in January to North Africa and the far East to get travel material for his Rambling Reporter Series distributed by Columbia. Another unit will be sent out by Bray next Spring to Italy and the Balkan States. The trips will cover about 10 months each.

Film Expedition to Brazil

AN EXPEDITION to obtain sound pictures of jungle life in Brazil is being organized by the University of Pennsylvania Museum and E. R. Fenimore Johnson, former vice president of the Victor Talking Machine Company.

The expedition will sail from New York for Montevideo about December 20, it is announced. Captain Vladimir Perfilieff, explorer and photographer, will head the company. The route will be up the Paraguay river to the Matto Grosso country. The party will return in a year.

Investment Film

THE BURTON HOLMES studios, Chicago, claims the distinction of being the first concern to produce an educational film dealing with the investment field. The picture, called "An Investment in American Prosperity," was given its first showing before a group of investment bankers at the Tavern Club.

In story form, the film relates the strength and scope of 28 of America's leading corporations. The importance of diversification in investment is emphasized.

Plans are being made to place the picture at the disposal of 800 investment houses and banking institutions throughout the country, which will arrange local guest showings.

General Electric Plans Studio in Schenectady

CONSTRUCTION of a studio at Schenectady is being contemplated by General Electric. Industrials and shorts will be made there. Preliminary matters were discussed at a recent dinner.

New S. M. P. E. Officers, Chicago

ELECTION of new officers of the Chicago section of the Society of Motion Picture Engineers has been announced. J. Elliott Jenkins is the newly elected Chairman; R. Fawn Mitchell is the Secretary and the Governors are Oscar B. Depue and Robert P. Burns.

Members of this Section now total 77.

A Happy and Prosperous New Year

IS EXTENDED TO OUR MANY FRIENDS OF THE MOTION PICTURE INDUSTRY

COMPOSITE LABORATORIES

"Williams' Shots"

HAPPY NEW YEAR . .

Agfa ——— Raw Film

C. KING CHARNEY

RCA, Auto Cinema Perfect Automatic Ad Projector

AN AUTOMATIC advertising projector that accommodates standard-size film has been perfected by RCA Photophone in association with Auto Cinema Corp., and will soon be put on the market, it is announced by Sydney E. Abel, general sales manager of Photophone. The machine, which will be leased by Auto Cinema and serviced by RCA Photophone, is compact, weighs less than 100 pounds and occupies less than two square feet of space. When placed in operation, the film is endless self-rewinding. Sound amplification can be controlled to any desired volume.

International Projector Announces New Turret

AN IMPROVED design lens turret which will accommodate three lenses of either quarter or half size, is announced by the International Projector Corp. of New York. All focal length lenses of standard make may be readily used in connection with it.

Each lens is separately adjustable with relation to the projection aperture, this assuring perfect alignment and super imposition on the screen. The turret is readily moved around from one lens position to another by means of convenient trip levers.

the AUDIO-CAMEX

COMPLETE PORTABLE SOUND EQUIPMENT

Camera Silencing Cover

This Camera Cover will fit both Mitchell and Bell & Howell Cameras.

IT ENABLES THE CAMERAMAN TO WORK
WITH FINDER OUTSIDE THE "BLIMP"

This is the first time a Camera Cover has ever been offered to the Craft.

Price \$50.00



Hollywood CAMERA EXCHANGE
CABLE: HOCAMEX-1511 CAHUENGA BLVD - PHONE HO 9431

Amateur Movie Making

by WILLIAM STULL, A. S. C.

THE WINTER months are perhaps the most critical ones in the entire year for the amateur cinematographer, for during these times of necessarily restricted photographic activity, he feels more and more frequently the urge to show his films to audiences. And, far too frequently, one such exhibition is enough to make the audience reluctant to attend another. Of course, people now-a-days are becoming increasingly skillful at these evasions, but when the mere suggestion of a home movie show brings forth a complete unanimity of headaches, previous engagements and sick friends, even the most rabid enthusiast can hardly fail to be a bit suspicious, especially when, as in most cases, these same evasive individuals are found surprisingly healthy, disengaged, and calloused to the ties of friendship when there is a good picture running at the local theatre.

Of course even the most enthusiastic amateur will admit that there is quite a difference between his own attempts at film presentation and those of the de Luxe show house. But he will generally fail to perceive that it is not a difference of materials, but one of methods. It is not merely the difference between the quality of films available to him and those available to the professional exhibitor. It is not the difference between silent films and talkies. It is not even the difference between a 4,000-seat "super-cinema" and an ordinary parlor.

It is solely a question of Showmanship.

Showmanship at Home

To the average amateur, Showmanship seems a thing as remote as the hinterlands of Timbuktu, and as far beyond his understanding as the Theory of Relativity. Of course, he may realize that it is a certain knack of quality which makes its possessors—like de Mille, "Roxy," or Sid Grauman—great figures in the entertainment world; but more than that, what is Showmanship to him?

But Showmanship is something which, if valuable to the professional impresario, is indispensable to the amateur. The greatest pleasure of amateur cinematography is the pleasure of showing films to other people, and Showmanship is the art of entertaining people.

Being an art, it can hardly be reduced to a set of formal rules or formulae; nevertheless, there are certain facts which, if kept in mind, and certain suggestions which, if followed, will form a key to the understanding of this art.

In the first place, no matter what you are doing, as long as you are working with an audience, the vital thing is to keep that audience entertained. Therefore, plan whatever you are doing with that one thought fixedly in your mind.

To keep the audience entertained, keep it interested. As long as a show (even a poor one), is moving along steadily, all is well; but let one hitch or interruption occur, and interest wavers; the spell is broken.

Next, take a tip from the professional: never give an audience too much of any one thing—no matter how good. Always let them be asking for just a little more, rather than complaining because you gave them too much. Never repeat if you can help it; if you can't, repeat but once.

Lastly, in planning a programme, plan it for your audience—not for yourself.

Now, how are these principles to be applied to the home movie show? For in the home presentation, we are naturally

limited in every respect. How can we rise above these inevitable limitations and give our friends a really interesting, entertaining show?

Programme-Building

First of all, we must have an entertaining programme with which to work. More than that, it must be entertainment that is suited to the audience in question. Obviously, a programme which will please an audience of children will not be likely to satisfy an audience of adults. Similarly, among adult audiences, there is a wide divergence of taste. It is to be noted that among the more recent professional film successes have been such entirely different sorts of entertainment as "Disraeli" and "The Life of the Party." Obviously, each of these films has given pleasure to its audiences, but each has appealed fundamentally to a different group. Therefore, in planning your own programmes, take care that you do not offer a "Disraeli" audience a "Life of the Party" programme—or vice versa!

The professional impresario works under a considerable disadvantage in that he cannot choose his audience, and must of necessity give his programme sufficient variety so that he is reasonably sure of finding something that will appeal to the highbrow, lowbrow, and mezzobrow contingents, as well as the inevitably large group of children and morons, who combine to bring him his bread and cheese. The amateur, on the other hand, can generally choose his audience, and then suit his programme to it. None the less, the principle of variety as practiced by the professional showman should to some extent be adopted by the amateur programme-builder.

In the first place, with the many excellent 16mm. film rental libraries now operating, no programme should confine itself exclusively to the product of the individual camerist. One may have quite enough film which is technically acceptable, to make a full evening's show, but there is all too frequently too little variety in such a programme. The film may be technically satisfactory, and even of a fair variety of subjects, but, in ninety-nine cases out of a hundred, there will be at least such a sameness of treatment about it all as to make it a very drab and uninteresting programme. Therefore, the best plan is to make up a well-balanced programme in the professional manner. Now, the best professional programmes usually consist of a newsreel, a scenic or novelty, a comedy, and a feature production. With the single exception of the newsreel, each of these classifications is represented in the catalogue of every rental library. Therefore, such programmes can easily be made up of rented films, with one's own productions taking their logical places, as dictated by their particular **genre**. The average amateur production, however, should almost always fall under one of the first three categories; the feature "spot" should be filled by an amateur film only when it is of indubitable technical excellence **and** outstanding entertainment value. As a rule, however, the feature should be a professional dramatic film, of real worth. In their proper position on the programme, however, individual films have no equal, for they have—or should have—a personal interest which no purchased or hired film-subject could have. But such amateur films must be, in every sense, finished products. They must be well edited and titled, with no flaws such as bad frames or missing scenes. They must, in a word,

(Continued on Page 32)

NO FILMO HAS EVER WORN OUT



Mr. John T. McCutcheon's Filmo, purchased more than six years ago, has accompanied its famous owner on scores of jaunts into the dim and unknown places of the earth. The excellence of Mr. McCutcheon's movies reflects the constant dependability of the Filmo that made them . . . a Filmo that is working as perfectly today as the day it was made.

Like the finest watches, the finest of motor cars, Filmo's value is appraised by what it will do and how long it will continue to do it. To say that no Filmo has ever worn out is the conclusive answer to the question of its performance, its stamina. That is why Filmo Personal Movie Cameras and Projectors are the first choice of discerning movie makers the world over.

You would expect no one to make a better movie camera than Bell & Howell, manufacturers for nearly a quarter of a century of professional studio cameras for the major film producers of the world. Filmo unquestionably fulfills this expectation, from the moderately priced Filmo 75 at \$92 and up, to the versatile Filmo 70-D at \$245 and up. Ask your dealer for a demonstration, or write for Booklet No. 35—it's

full of fascinating information. Bell & Howell Co., 1848 Larchmont Avenue, Chicago, Illinois. New York, Hollywood, London (B. & H. Co., Ltd.).

Established 1907

BELL & HOWELL FILMO
PERSONAL MOVIE CAMERAS AND PROJECTORS

Amateur Movie Making

(Continued from Page 30)

be able to stand upon their own feet as screen entertainment, with no need of apologies or explanations from the maker.

Presentation—or Projection?

Once a programme has been chosen, it must be shown to its audience. But, how is it to be shown? Is it to be merely a matter of putting the projector on a table, and the screen on another, and "running off some films," or is there to be some attempt at presentation? Is the show to be a pleasure, or an ordeal?

The answer to this rests solely with you. To answer it fairly, you must put yourself in the place of your guests.

You, personally, are an enthusiast and a technician.

They are neither.

You understand the mechanical factors in film making and projection.

They do not.

You can overlook mechanical imperfections in both the film and its presentation.

They cannot.

You can judge a programme by all of the many factors, from camera to screen, which enter into its creation.

They can judge only by the results they see on the screen.

Therefore, since results are all that count with audience, either give them first-class results, or don't try to give them anything. There is no room for half-way measures.

In securing such results, the first thing is to be completely prepared for every possible emergency. Have every detail of your performance carefully planned and well rehearsed, so that there can be no hitch during the actual showing.

Make the mechanical features of your programme as unobtrusive as possible. Of course, a motion picture performance is inescapably of a mechanical nature, but it need not be made too obviously so. Conceal as much of the mechanics of the performance from your audience as you can. If it is at all possible, have the projector placed so that it is out of sight, and if possible, more or less out of ear-shot, as the clatter of a projection-machine is by no means a pleasant accompaniment. If you can arrange things so that the audience and screen are in one room, with the projector in another, you will have a very good arrangement. If your rooms do not allow this, another excellent method is back-projection: projecting the picture onto the rear of a translucent screen. This will, of course, necessitate re-spooling your films, in order that the action and titles may not be reversed. Another method of rear-projection, which does not involve re-spooled film, is arranging the projector and screen at right angles to each other, and projecting with the aid of a good, clear mirror. By this method, you may seat your audience in a room, and place your projector in an adjacent hallway, quite out of sight.

Of course, however, the ideal method of home-movie presentation is in a room exclusively devoted to such service, and which may be a real home theatre. In such a room, you can give your artistic inclinations full play, placing your screen permanently, with artistic stage-settings and curtains in front of it. You can then have all sorts of footlight-and-floodlight arrangements, with which you can duplicate the lighting effects used in professional theatre practice. In such an installation, too, you can have everything—curtains, footlights, house lights, etc.—controlled from a bank of switches and dimmers near your projector, or your booth, if you have one. With such an equipment, you have everything at hand for the presentation of de luxe home movie shows. Of course, unless you are decidedly richer than most of us, you will still be limited to a single projector, which will still necessitate the unpleasant pauses between reels. However, these can be bridged over very nicely by a number of means; closing the curtains, and projecting upon them various patterned light-effects, and so on.

But several other methods are available: the main thing being to keep the audience entertained during these necessary pauses. One friend of mine, for instance, has a small lantern-slide projector, with which projects onto the screen a series of slides with cleverly illustrated, witty, and somewhat racy jokes.

Show It With Music!

But perhaps the greatest aid to the de luxe film presentation is a musical accompaniment. Professional theatre-managers long ago learned this, and, until the advent of the Vitaphone, supported large symphony orchestras, expert organists, and highly-paid thematic-score-writers, all for the purpose of being able to give to each scene of each picture exactly the best and most fitting musical background. Naturally, this is beyond the amateur; but, if he has in his family a really accomplished instrumentalist, with a large and diverse repertoire, he may call upon this obliging relative to serve as an orchestra. But, as most of us do not boast such talented relations, there is, fortunately, an even better substitute in the phonograph.

The modern electrically-reproducing phonograph, with a proper selection of well-chosen records, will give the amateur showhouse the equivalent of the best orchestras and organs in the world. Furthermore, the orchestra can be operated by the projectionist, which is another important advantage for the amateur. But what sort of equipment is the best for the amateur?

First of all, the average "Automatic" phonograph is entirely useless for this purpose. In the first place, its cost is far greater than the need warrants. In the second place, it plays its selection of records straight through, playing the complete records from start to finish, whereas, for your purpose, you may want to start in the middle of a record, and only play a few bars, before repeating, or changing to another record. Therefore the "Automatic" machine is hardly suitable.

The ordinary electric-reproducing phonograph, Victor, Columbia, Brunswick, Majestic, Philco, or what have you, is however quite well adapted to this service. However, it has the same drawback that a single projector has: the pauses while you change the records. And these pauses may become quite annoying, as they will occur more frequently than the changes of film, for you will seldom play a record through, but merely use a certain theme in it.

Therefore, by all means the best reproducing outfit is one that contains two electrical pickups, two turntables, and a "Fader," for making musical lap-dissolves from one selection to another. Such an outfit can easily enough be assembled from such standard parts as a pair of "Columbia" or "Rotrola" portable turntable-and-pickup combinations, with the amplification and reproduction through any good radio and dynamic-cone speaker. The combination of these two units with one of the various efficient "midget" radios now so popular would make a very excellent sound installation at a cost approximating \$100. However, this price might easily be bettered, by using all, or parts of some of the non-synchronous outfits which so many of the smaller theatres installed in the earlier days of sound-pictures, and which they have since been forced to discard. The turntable part of such outfits are particularly handy for this use, as they were designed expressly for the same sort of work in theatres. Probably the most important feature is that the pick-up arms are generally connected to pointers working over graduated scales, by means of which the needle can be accurately set down at any pre-determined point. Any sort of amplifying apparatus may be used with these twin-turntable outfits, but it must be remembered that the better the amplifier and speaker, the better will be the sound.

But whatever means of reproduction is used, the selection of records is the vital thing. This selection need not be large, but it should be sufficiently comprehensive to have appropriate music for every important type of scene. You may, if you wish, have your accompanying music exclusively of organ

recordings, or of orchestral ones, or of both. Both orchestras and organs were used for accompanying silent pictures, and, where the music was properly chosen and executed, the change from orchestra to organ, or vice versa, was practically imperceptible. The truly important thing, however, is to have the right records, and to be so familiar with the picture that you can use the appropriate music for each scene. This involves some considerable rehearsal of film and records, but it is well worth it. It is a good plan, too, to make out a "cue sheet" for each reel on your programme, stating the selection, the part of the record, and the screen cue for each change. With this, and a little practice with the fader, you will have no trouble in duplicating the effects of the finest symphonic accompaniments of the greatest super-theatres.

Naturally, the selection of the appropriate records is a somewhat difficult task. However, it is lightened by the fact that each scene or sequence in a feature film will fall more or less closely under some arbitrary classification as to mood, and thus, by having music to suit every mood, you will be quite reasonably sure of having music to fit every situation. This implies a moderately large library of recordings, but if you make your purchases discreetly and consistently—say one or two discs a week—a good collection can be built up rapidly and with the minimum strain upon the pocketbook.

The best scoring library, of course, is the one which is large enough to afford the user a considerable variety of selections for each type of scene, and one which is large enough as well to avoid the use of the more obvious musical themes. But such a library is, of course, considerably beyond the means of most of us, so we must content ourselves with one which, if not so comprehensive, is yet sufficient to provide for every mood, and give some variety. But the delightful thing about such a library is that it is in itself, quite apart from its utility in cinema presentation, something very much worth having. And of course such a library may be enlarged to any degree, as the means and the interest warrant. Here, however, is an outline suggesting a nucleus for a very effective scoring library, listed under the moods to which each is appropriate.

BATTLES, RIOTS, EXCITEMENT—

"Ruy Blas Overture" (Mendelssohn)—B. B. C. Orchestra—Columbia 50119D.

"Ride of the Valkyries" (Wagner)—Coates & Symphony Orchestra—Victor 9163.

"Flying Dutchman Overture" (Wagner)—Berlin State Opera Orchestra—Victor 9275.

"Egmont Overture" (Beethoven)—Victor Symphony Orchestra—Victor 35790.

BALLET

"Dance of the Hours"—Ponchielli—Victor Symphony Orchestra—Victor 35833.

"Faust Ballet Music"—(Gounod)—Royal Opera Orchestra, Covent Garden—His Master's Voice (English Victor) C1462 and 3.

"Scarf Dance" (Chaminade)—Columbia Symphony Orchestra—Columbia 1658D.

"Fantasy from Coppelia Ballet"—Delibes—Dr. Weissmann and the Grand Symphony Orchestra, Berlin—Odeon 5162.

CARNIVAL, JOY, ETC.

"Merry Wives of Windsor, Overture" (Nicolai)—Victor Symphony Orchestra—Victor 35764.

"Carneval Overture" (Dvorak)—Hollywood Bowl Orchestra—Victor 6868.

"Bank Holiday" from the "Cockney Suite" (Ketelbey)—Albert W. Ketelbey and his Concert Orchestra—British Columbia—9862.

CHINESE

"In a Chinese Temple Garden"—(Ketelbey)—Albert W. Ketelbey and his Concert Orchestra—British Columbia 9859.

"A Japanese Sunset"—(Jessie L. Deppen)—Victor Salon Orchestra—Victor 20998.

"Chinese Lullaby"—(Bowers)—Victor Salon Orchestra—Victor 21970.

DEATH SCENES, ETC.

"Largo" from "New World Symphony" (Dvorak)—Philadelphia Symphony Orchestra—Victor Album M-1.

"Chanson Triste" (Tchaikowsky)—String Bass Solo by Serge Koussevitski—Victor 7159.

"Death of Ase" from Peer Gynt Suite (Greig)—Victor Symphony Orchestra—Victor 35793.

"Unfinished Symphony" (Schubert)—Philadelphia Symphony

DRAMATIC SCENES, ETC.

Orchestra—Victor Album M16.

"Les Preludes" (Liszt) San Francisco Symphony Orchestra—Victor 6863 and 4.

"Traviata Fantasy"—(Verdi)—Marck Weber and his Orchestra—Victor V-50015.

FIRES, GALES, ETC.

Much as for BATTLE SCENES;

"Fire Music from Siegfried" (Wagner)—Beyreuth Festival Orchestra—Columbia 67372D.

GALLOPS, RACING, BUSTLE, ETC.

"Orpheus in Hades" (Offenbach)—Victor Symphony Orchestra—Victor 35881.

"Light Cavalry Overture" (von Suppe) Victor Symphony Orchestra—Victor 21251.

"Zampa Overture" (Herold)—Continental Symphony Orchestra—Victor V-50006.

ITALIAN, SPANISH, SCOTCH, IRISH, ETC.

These selections are all obvious, and hardly need to be listed here.

LOVE SCENES

These scenes require music which is predominantly by the string section of the orchestra, or violin or 'cello solos.

"Simple Aveu" (Thome)—Cello solo by Alfred Wallenstein—Victor 20104.

"Narcissus" (Nevin)—Victor Concert Orchestra—Victor 21449.

"A Little Love, A Little Kiss"—(Ross-Sileseu)—Victor Salon Orchestra—Victor 20279.

"When You and I Were Seventeen" (Kahn-Rosoff)—Victor Salon Orchestra—Victor 19702.

"Londonderry Air" (Traditional) Organ solo by Reginald Goss-Custard, F. R. C. O.—H. M. V. B2375.

"Serenata" (Tosselli) deGroot and the Piccadilly Orchestra—H. M. V. B2086.

ORIENTAL, EASTERN, ETC.

"Ballet Egyptian" (Luigini)—Concert Orchestra—Victor 35794 and 5; Movie Organ Solo by Quentin MacLean—Columbia 1365 and 7 D.

"Indian Love Lyrics" (Woodforde-Finden) deGroot's Piccadilly Orchestra—H. M. V. C1257 and B2237.

"Indian Love Lyrics" (Woodforde-Finden) Movie Organ, G. T. Pattman—British Columbia 9417.

"Casse Noisette Suite" (Tchaikowsky); "Danse Arabe"—British Broadcasting Company's Wireless Symphony Orchestra—Columbia 50106D.

"Egyptian Suite—African Motives" (Bardi)—Dajos Bela and his Orchestra—Odeon 3256.

"In a Persian Market" (Ketelbey)—International Concert Orchestra—Victor 35fff.

NATURE; RUSTIC SCENES; SCENIC FILMS

"Summer Days Suite" (Coates) Coates and Orchestra—British Columbia 9369-9370.

"Peer Gynt Suite: Morning" (Greig)—Victor Recording Orchestra—Victor 35793.

"Shepherd's Hey" (Grainger) Victor Concert Orchestra—Victor 20802.

"Siegfried: Forest Murmurs" (Wagner) Philharmonic-Symphony Orchestra of New York—Victor 7192.

(Continued on Page 36)

About Lenses

Part 3

The Apertures of Lenses

[First installment appeared in October issue.]

LENSES differ in the amount of light they admit, and this is very important, because the more light admitted, the shorter the exposure can be. The chief object in using a lens instead of a pinhole is to transmit more light to the film, and the amount of light that is transmitted depends upon the area of the glass in the lens.

Suppose we place a piece of cardboard, instead of a film, in the back of a camera, and have a pinhole in the card through which we can look at the lens; then point the lens toward a window; the amount of light that reaches the eye through the hole in the card depends upon how much of the light from the window is passing through the lens; that is to say, it will depend on the area of the window which we could see if there was no glass in the lens. Since the visible area of the window is bounded by the edges of the lens mount, we could see more if the lens were of shorter focal length so that the eye would be closer to it. With a lens of long focal length only a small part of the window area is visible as in Fig. 15.

With a lens of half the focal length, but of the same diameter as that shown in Fig. 15, four times as much of the window area is visible, see Fig. 16.

This shows that the brightness of the image projected by lenses of the same diameter varies inversely as the square of the focal length of the lens. It also varies as the area of

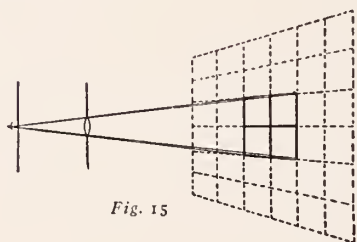


Fig. 15

the lens surface (aperture) which admits the light. The greater the lens aperture the more light it admits. The area of the lens aperture, of course, is proportional to the square of its diameter, so that all lenses in which the diameter of the aperture bears the same ratio to the focal length will give equally bright images. This means that the brightness of the image is determined not solely by the focal length, nor solely by the diameter of the lens aperture, but by the **relation** that exists between the lens aperture and the focal length of the lens, so that all lenses in which the diameter of the opening is, say, one-sixth of the focal length, will give equally bright images. Thus, in a lens of one-inch aperture and a focal length of six inches, the opening is one-sixth of the focal length, and in a lens of twelve inches focal length and two inches aperture, the opening is likewise one-sixth of the focal length. Both lenses are of the same *f.* value. This means that both give an image of the same brightness, and will require the same exposure. Lens "apertures" are, therefore, rated according to the ratio between their diameters and their focal lengths; thus, one in which the opening is one-sixth of the focal length is marked *f.6*; one in which the opening is one-eighth, *f.8*, and so on, and the larger the aperture, the more light the lens transmits, and the more light it transmits the shorter the exposure needed.

But even when we have a lens with a large aperture we

shall have to regard this as a reserve power for use in special circumstances, and we should not by any means use it at its largest aperture all the time.

Depth of Focus

From the construction of a lens it follows that only the rays from a mathematical point can come together in a point again,

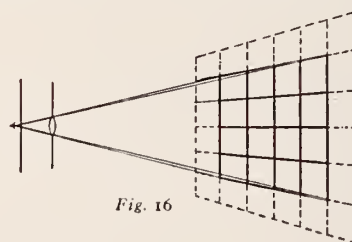


Fig. 16

and that the rays from any point nearer or farther than the point focused cannot meet in a point image on the film, but must produce a small disc of light instead of a sharp point of light.

The disc is termed the "circle of confusion." If the circle of confusion is small enough we shall not be able to distinguish it from a point, and the picture will appear to be sharp.

With what are known as "fixed focus" cameras such as the Model B Vest Pocket Kodak and the box Brownies, no attempt is made to secure a wholly sharp focus for objects at all distances, but the lenses are sharply focused on the nearest point to the camera which will enable distant objects to appear approximately sharp in the pictures, and in this way objects in the middle distance are perfectly sharp, and near objects are also sharp provided they are not too near.

The following table of these distances, beyond which everything is sharp when the largest stop is used, may be useful:

Vest Pocket Kodak (Model B)	7½ feet
No. 0 Brownie	7½ feet
No. 2 Brownie	11 feet
Nos. 2A, 2C and 3 Brownies	13 feet

If we are using a No. 2 Brownie, for instance, as long as everything is farther off than eleven (11) feet we can rely on getting a picture with everything focused sharply.

With the focusing Kodaks we must judge the distance of the object on which we wish the focus to be sharpest and set the scale to that; then we shall find that objects somewhat nearer, and also objects a good deal farther from the camera are also sharp, and the distance from the nearest to the farthest objects that appear sharp in the negative is called the "depth of focus." This depth of focus depends on the focal length of

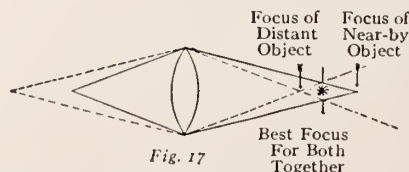


Fig. 17

the lens and on the size of stop used in the lens; the greater the focal length the less the depth of focus, and the **bigger the stop the less the depth of focus**. Thus in Fig. 17, we have

a lens focusing near and far points at full aperture and producing large circles of confusion. In Fig. 18 a smaller stop is used in the same lens, and the circles diminish in size in proportion to reduction in the size of the stop.

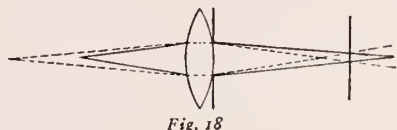


Fig. 18

Sometimes we have to focus near objects at the same time as distant ones, so that it is necessary to "stop the lens down" to some extent.

Stops are marked on two different systems, though both are based on the fundamental ratio of the diameter to the focal length of the lens. In the one system the stop is expressed simply as a fraction of the focal length; thus F./8 (commonly written f.8) means that the aperture is one-eighth of the focal length of the lens; f.16, one-sixteenth, and so on. The rectilinear lenses that are fitted to some of the Hawk-Eye cameras are marked in the "Uniform System" (U.S.) in which the numbers are proportional to the expose required, f.4 being taken as unity, so that the scale is as follows:

F.	f.4	f.4.5	f.5.6	f.6.3	f.8	f.11	f.16	f.22	f.32	f.45
U.S.	1	1.26	2	2½	4	8	16	32	64	128

This table also shows the relative exposure that is required with the f. system stops, the exposure varying as the square of the f. value, so that f.11 requires twice the exposure of f.8; f.16 twice that of f.11 and so on.

In the case of the larger stops, f.6.3 requires about twice the exposure of f.4.5; and f.8 twice that of f.5.6.

Bobby Jones "Filmoed" by Prince of Wales

THE PRINCE OF WALES is an enthusiast on the subject of taking golf movies, according to Golfdom magazine, and used his own personal Filmo movie camera to take pictures of Bobby Jones when the latter was playing in Britain last summer.

The Prince is also greatly interested in the project which the Professional Golfers Association of America has been carrying through of making super-slow golf demonstration movies of such stars as Jones, Vardon and Wethered.

After he learned of the taking of some of these movies in England he requested that a complete set be sent to him at the earliest possible moment. This was done by George Sargent, a director of the Association, who was abroad for some time in connection with making the Vardon and Wethered golf pictures. At the same time Mr. Sargent transmitted to His Royal Highness an invitation to attend the Ryder Cup international Professional Matches at Scioto Country Club, Columbus, Ohio, next summer.

Trespassers Will Be Prosecuted

HOW OFTEN has the above notice prevented the capture of a beautiful or interesting photographic subject! Just remember that a telephoto lens will make the "No Trespassing" sign something that will be of no inconvenience to you. And, too, that interesting shot you want may be prevented because of a police cordon or a crowd. A telephoto lens will save it for you.

Cine-Kodak in Arctic



Here we see Dr. Knud Rasmussen, explorer, with his Cine-Kodak at Thule, Greenland.

Paramount's New Color Process Out of Lab Stage

PARAMOUNT'S new color process, details of which have been guarded closely over a two-year period, is understood to be ready for studio use. The method is said to use a new type color-cap over a regular camera lens.

Wilcox Boosted

HERBERT M. WILCOX has been elected vice president in charge of operating of Erpi.

The new vice president has been operating manager in charge of installing and servicing Western Electric sound equipment. He has been associated with Western Electric since April, 1926, going in as operating manager of Erpi when the latter company was formed in January, 1927. Previous to that he was under Otterson for 11 years with the Winchester Repeating Arms Company.

College Adopts Talkers in Study

TALKING pictures have been inaugurated as a part of the regular work of the undergraduate body, by Hunter College. Two educational subjects were shown.

Talkers for Schools in England

EDUCATIONAL authorities, in co-operation with Western Electric and British Movietone News, are working out plans for daily 40-minute talker programs in Middlesex schools. First subjects will be principally "general knowledge" types.

Machinery or Art in Pictures

(Continued from Page 11)

Many of these pictures run to type, such as crook stories, wild party stories, college stories, and any number of others. Often they contain technical as well as artistic fallacies. Generally they just cover the surface of the type of life they depict. Often several pictures with the same star are extremely similar in plot.

College life, for instance, offers many story plots outside of football. Then, the idea of the hero planning to join a gang of crooks after some quarrel with his sweetheart, and then having her save him at the last minute before he has been given a real chance to go wrong, has been badly overdone. Lately, for some reason or other, there has been a fortunate succession of football stars being kept out of the game until the last few minutes, and then scoring the winning touchdown. Let us hope that when some more football stories appear, something different will occur.

The advance of color photography offers many opportunities to the film world. Unfortunately, color has not yet been perfected so as to leave out all streaks, or to include all colors, but color does not provide added artistry in spite of its shortcomings. But colors, like anything else, should be chosen with care. While they will probably add only to the pictorial effect, rather than the dramatic possibilities, the use of poor color combinations will detract from the centralized interest of the plot.

As time goes on color will be more and more in use. It will be especially valuable in outdoor photography, and in achieving effects which the black and white is unable to achieve. At present, however, it is still to be experimented with, and is expensive. But the time will no doubt come when the use of color will be as universal as the use of sound.

While the artistry of a motion picture depends mainly upon those connected with the acting and directing, there are hundreds of semi-mechanical processes entering into the question and contributing a great deal toward artistic achievement. Photography, sound-recording, projection, color recording, and numerous other technical processes are also necessary for the proper taking and showing of a picture. The work of these technicians receives little credit from the general public, and if their names be added to the list of credits shown at the beginning of a picture, the nature of their work is not known anyway. They are the stage hands of the motion picture industry.

But the chief responsibility for the motion picture as an art rests with the producers. As long as their primary interest is that of earning money, the brand of pictures will be anything but the best. It is useless to acquire theatres and have nothing worth showing in them.

American life has drifted too much toward making financial remuneration the reward of industry. In lines of work dull in themselves there is little wonder that such should be the accepted attitude. But a vocation itself should be of as much interest, or rather, of greater interest, than the money to be made—and this applies to every one from the president of a concern on down.

Greater interest in the creative side of motion picture work from the producers will inspire greater activity from the artists, whose interest in their work is liable to be high to begin with. But a succession of mechanical plots arranged only to satisfy expected box office receipts will mean more or less mechanical acting. Unwillingness to experiment, especially when the failure of the experiment may mean looking for a new position, is a natural reaction of the director to present conditions.

The motion picture industry must remember that somebody will have to break the trail. Waiting for a book or a play to make a name for itself before accepting it for motion pictures is the act of a parasite. Playing safe is all right to a certain extent, but there are limits.

The popularity of the talking picture as a talking picture

has worn off. Something new, or preferably, something better, is now demanded. Quality is generally an even better attraction than novelty. Wide screens are making their appearance, but are, after all, merely a technical improvement.

Some machinery is necessary for carrying out anything, but the machine is only a method. It should not be of more importance than the work it is to do. Art is a matter of individualism, or careful study and preparation, and, in the motion picture, of cheerful cooperation. The motion picture production demands clearer thought and less impatience, more attention to major points, and less to minor technical details. greater attention to producing the worth-while pictures the public really does want, and less to production of the trash some morons believe the public wants.

Amateur Movie Making

(Continued from Page 33)

This list can, naturally, be extended almost without limits, as it covers a very broad variety of scenes, and may include many types of music.

PROCESSIONS; HISTORICAL

"Aida: Grand March" (Verdi) Creatore's Band—Victor 35780.

"Merchant of Venice: Doge's March" (Rosse)—Movie Organ Solo by Quentin MacLean—British Columbia 9586.

"Coronation March from The Prophet" (Meyerbeer) Mengelberg and the Philharmonic-Symphony Orchestra—Victor 7104.

"Cockney Suite: A State Procession" (Ketelbey)—Albert W. Ketelbey and his Concert Orchestra—British Columbia 9860.

RELIGIOUS; CHURCH SCENES

"Ave Maria" (Gounod) Charles O'Connell, Organ—Victor 21216.

"In a Monastery Garden" (Ketelbey)—Movie Organ, Reginald Foort—Victor 35821.

"Largo" (Handel)—Organ, Lew White—Brunswick 20083.

STORMS


"Flying Dutchman Overture" (Wagner) Berlin State Opera Orchestra—Victor 9275.

"Adagio from New World Symphony" (Dvorak) Philadelphia Symphony Orchestra in Victor Album M-1.

"The Storm" (Pattman) Movie Organ Solo by G. T. Pattman—Columbia 50252-D.

(Continued on Page 39)

To
**ALL MY FRIENDS
 ALL OVER THE
 WORLD . . .**
 I WISH A
*Happy
 and Prosperous*
1931

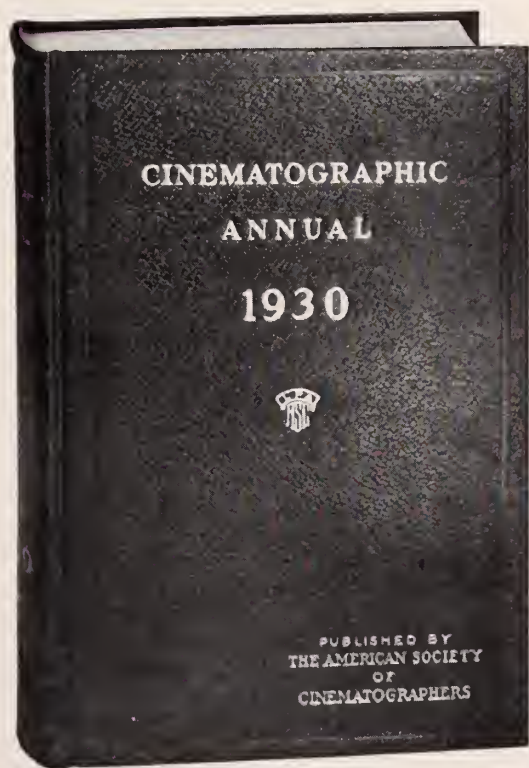


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Interesting Figures Revealed by Census Bureau

AN INCREASE of more than \$46,000,000 in production costs from 1927 to 1929 is shown by figures gathered in the 1929 census of manufactures, made public yesterday by the Census Bureau. The total cost of work done by 143 establishments last year was \$180,864,319, compared with \$134,343,360 spent by 142 companies in 1927. Half of the increase was in theatrical films, of which 2,543 were produced last year at a cost of \$118,692,733, against 1,347 costing \$92,593,732 in 1927.

For the first time the bureau was able to segregate productions so as to show sound and silent pictures separately, the 1929 production including 344 negatives with sound, costing \$34,186,010, 689 with dialogue, costing \$67,719,427, and 1,510 silent, costing \$16,787,296. Expenditures on unfinished productions last year totaled \$17,888,180, compared with \$13,267,338 in 1927.

News films are shown to have cost \$2,923,286 last year, against \$2,499,660 in 1927; advertising pictures, \$3,367,-

160 against \$617,466, and educational films \$192,242 against \$337,159.

Other items listed are: Laboratory work, positive films, \$10,698,678 against \$12,491,088, and receipts for lab work done for others, \$21,116,060 against \$11,921,655; value of other work done, \$1,647,698 against \$615,262; and receipts for use of studio facilities, \$4,338,282, not reported separately in 1927.

The report shows the number of salaried officers and employees last year as 8,298, against 7,598 in 1927; the average number of wage earners, 10,785 against 8,415; salaries paid, \$58,920,014 against \$56,298,560, and wage payments, \$24,722,053 against \$18,637,005. The cost of materials, fuel and purchased electric current is given as \$38,166,988, against \$34,867,472, and payments for contract work, \$9,437,452 against \$15,476,548.

The figures cover only production and do not extend to distribution or theatre operation.

\$18,000,000 PROGRAM AT UNIVERSAL

ANNOUNCING the largest budget in the history of Universal Pictures, Carl Laemmle, president, today revealed that \$18,000,000 would be spent in film production during the 1931-32 season.

This is \$3,000,000 more than the amount spent during the past season, which was the most active in the annals of the organization.

Quality pictures, rather than quantity, with especial emphasis on stories, will be the policy, Mr. Laemmle stated.

The definite number of pictures for 1931 has yet to be determined, according to Carl Laemmle, Jr., in charge of pro-

duction, but it is contemplated that the program will contain a few more feature pictures than last years. The number of short reels and serials will remain the same.

The \$18,000,000 budget does not include the amount that Universal will spend on stage plays for Broadway production.

Conferences are now being held on the pictures to be produced, and the first of the group will be announced shortly after the New Year, Mr. Laemmle, Jr., stated. More original screen stories will be sought, and a number of new personalities introduced.

Seventy Features Planned by Paramount for 1931-32

PARAMOUNT will have between 70 and 75 features on its 1931-32 program, Adolph Zukor told "The Film Daily" recently as he arrived at Grand Central Station from the Coast. This would mean an increase of from five to ten over 1930-31.

"Business is all right," he said, referring to his own organization.

10 U. S. Films Banned Last Year in India

AREPORT to the House of Commons, compiled by Wedgwood Benn, Secretary of State for India, revealed that 10 American subjects were prohibited from public exhibition in that country during the twelve months ended Sept. 30. Films barred were "Anarkali, or the Monument of Tears," "Charge of the Gauchos," "Drums of Love," "King of the Khyber Rifles," "The Letter," "The Red Dance," "Scarlet Lady," "Truth About Sex," and "The Very Idea."

55 Photophones in Australia

R-C-A PHOTOPHONE has just completed its 55th installation of sound equipment in Australia. The list includes 18 houses in the Hoyt circuit.

New Laboratory at Radio Pictures to Employ 500 Workers

HAVING purchased four lots just across from the studios, at Gower and Waring streets, Radio Pictures immediately will start work on million-dollar laboratory, which when completed, will give employment to at least 500 people. Several thousand artisans will be put to work constructing the buildings.

Theatre Wiring Increase in India

MADAN BROTHERS, the biggest cinema in India, have so far only wired their houses which cater for the European population. They have now decided that the time is ripe to install talking picture apparatus in their other theatres which cater for the native population. That this decision is correct is proved beyond doubt by the great success of the recently equipped Crown Cinema, Calcutta, which is a native theatre, and which has been packed to capacity at each performance ever since it opened.

Technician Mission

ASPECIAL mission of technicians has been commissioned by Gaumont of Paris to visit the principal film trade centers of the world. The mission is authorized to study the equipment of the ideal sound-film studio. It is expected to arrive in London at an early date.

Relegated to the Junk Pile



WHEN ALADDIN, some several thousand years ago, went crying through the streets, "New lamps for old," he was in search of that magic lamp that was able to produce anything that its bidder asked for. Heavily laden with all sorts and sizes of equipment that evidently would produce light, Aladdin, at great cost to himself, offered these lamps for the one type and design upon which he confidently could rely. It had produced everything that he had demanded.

Several thousand years later, today to be exact, scores of modern Aladdins in our most profitable motion picture institutions are gaining immediate response for efficiency and everything else that they demand from lamps that Aladdin would have coveted.

Aladdin's lamp evidently was silent in operation, a feature that would have pleased the producer of today—but that

vital factor with the other merits of the Aladdin lamp, are to be found in modern Laco Lites.

We know that had Aladdin lived in this age of precision and performance, and had been engaged in the production of motion pictures he would not be forced to search for the one and only proven efficient lite. For Laco Lites, made in a number of sizes and designs to meet every studio requirement, are built with a precision that makes a battery of them work as one—and the sets of our studios are equipped with them—all there to do their magic bidding.

The lamps illustrated on this page are not three thousand years old, yet they represent a few of the many whose places have been taken by Laco incandescent equipment—yes they ARE silent now.

Amateur Movie Making

(Continued from Page 36)

TRAGIC SCENES

"Prelude in C Sharp Minor" (Rachmaninoff)—Victor Concert Orchestra—Victor 35951.

"Cockney Suite: Elegy ("Thoughts on Passing the Cenotaph") (Ketelbey)—Albert W. Ketelbey and His Orchestra—British Columbia 9861.

"New World Symphony" (Dvorak)—Philadelphia Symphony Orchestra—Victor Album M-1.

WEIRD, MYSTERIOUS

"Unfinished Symphony" (Schubert)—Philadelphia Symphony Orchestra—Victor Album M-16.

"Fantastic Symphony" (Berlioz)—London Symphony Orchestra—Columbia Album 34.

"Funeral March of a Marionette" (Gounod)—San Francisco Symphony Orchestra—Victor 6639.

In addition to these general classes, it may be remarked that some types of film-subject may be used with almost any sort of music: Comedies, for instance, go well with up-to-date dance-music, news-films with military marches, and so on. Scenic or travel films allow the use of many beautiful and interesting compositions which can seldom be used otherwise: however, as in every other department of cinematic endeavor, it must not be forgotten that the score must be but an auxiliary to the picture on the screen—not a show in itself. Used properly, it is one of the most effective aids to successful presentation; abused, it can quite as easily spoil the show. Therefore, if you would please your audience, in your scoring, as in all other branches of your presentation, let good taste reign.

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Extensive 1931 Schedule Planned by Fogwell, Ltd.

LONDON—Reginald Fogwell Productions, Ltd., has announced plans for an extensive increase in production activities for 1931. Having just completed "Madame Guillotine," the company early in January will star Percy Marmont in an adaptation of the Gilbert Frankau novel, "Martin Make Believe." In March, "Black Damp," a mining story, will be placed before the cameras. Other vehicles for the new schedule are being lined up and Madeleine Carroll, who was recently signed to a \$50,000 contract, will be featured.

German Talkers in Prague

PRAGUE—After being barred since the demonstrations of last September, German pictures will again be shown in three Prague houses. Lack of suitable domestic material compelled the decision.

Austrian Production Revived

VIENNA—Talkers have brought about a revival of production in Austria. The first sound picture to be exported from here is now showing in Berlin and its success is credited to the inventor of the Selenophon sound recording system. The Selenophon studio is available to foreign companies desiring to produce in Austria.

Bank to Aid French Industry

PARIS—Banque de la Cinematographie Francaise, formerly known as the Union Cinematographique Francaise, plans to act as a central body for financing of film industry projects in this country.

W. M. Brown on British RCA Board

LONDON—W. M. Brown, general manager of the Gramophone Co. and a director of Associated Radio Pictures, British branch of R-K-O, has been appointed a member of the board of directors of R-C-A Photophone.

Filmo Topics

THE FOLLOWING is the list of contents for the January issue of "Filmo Topics," the very interesting and instructive monthly publication issued by the Bell & Howell Company. Copies will be mailed free if you send your request to the Bell & Howell Company, 1801 Larchmont Avenue, Chicago, Ill.:

FILMING EUROPE'S BEST SKI JUMPERS

Movie making on the famous Holmenkollen Hill during International Sports Week in Norway. By Fred H. Harris, Treasurer, National Ski Association of America.

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FROM CAPE TO CAIRO

A movie maker's journey with his Filmo 70-D over Rhodes' dream route. By J. W. Albright.

FILMO NEWS PICTORIAL

TITLING YOUR FILMS

No. 4 Trick Titles.

SNOW CINEMATOGRAPHY

How to capture winter's beauty with your Filmo. By E. Fawn Mitchell.

FILM CONTROL IN THE CHANNEL

Article No. 13 of the "Facts About Filmo" Series, explaining how film is accurately registered at the Filmo Projector's Aperture. By Joseph A. Dubray.

B. & H. Announce Talkie Reproducer with Microphone Feature



A SPECIAL microphone arrangement which will enable the operator to interject remarks relative to any picture which is being shown and to have his voice come from the loud speaker in entirely satisfactory volume, is hailed as a revolutionary feature of the new Bell & Howell portable 16 mm. talkie reproducer, the Filmophone.

This new combination is especially valuable for business, educational, church and small theatre use. It will also be warmly welcomed in the home.

The Filmophone itself is absolutely portable in the true sense of that word. It comes in two cases, of approximately equal size, shape and weight, totaling 88 pounds. It employs a Filmo Projector for showing pictures, using 16 mm. amateur size film. Sound is obtained by a synchronized phonograph type of disc, the same as used in theatres.

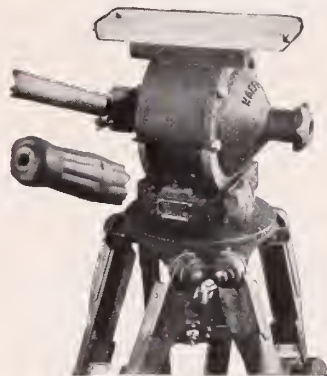
The Filmophone, it is stated, presents the ultimate in tonal qualities in portable sound movie reproducers. It produces volume sufficient for audiences of several thousand. With it perfect synchronization is achieved with greatest ease. It has a worm drive of unique design, thus eliminating the double motor feature and avoiding any possibility of slack in the mechanical coupling which would, of course, destroy synchronization. The Filmophone is a product of the Bell & Howell engineering laboratories and carries with it the Bell & Howell manufacturing guarantee.



The microphone feature permits the operator to plug in conveniently at any time, automatically cut out the musical or verbal record accompaniment and make any comments desired in order to emphasize points of a film which may need any comments desired in order to emphasize points of a film which may need stressing to meet a specific situation. When a switch on the microphone is released the record sound accompaniment is resumed.

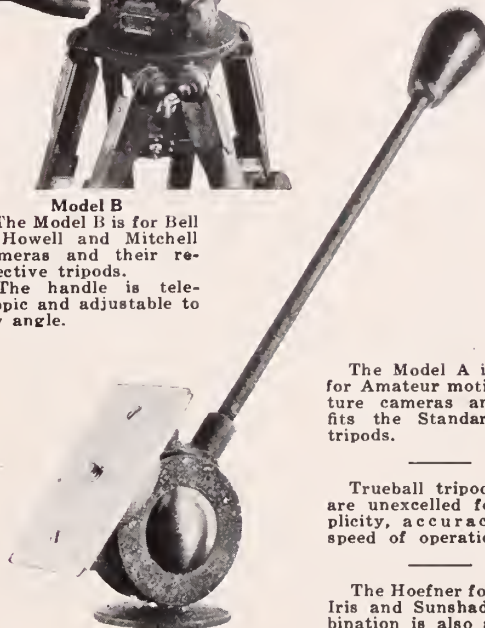
A notable advantage of this microphone arrangement lies in the fact that it will obviously make it possible to use many

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silent pictures to good advantage. A salesman, for instance, can talk into the microphone while showing a silent film and explain his company's product and have his voice accompany the picture in a volume equal to that of the Filmophone when it is presenting a sound picture, so that a large audience can hear him easily. The Filmophone will be marketed with the microphone attachment or it may be secured without the microphone feature which can then be added later.

One of the two cases which house the Filmophone contains turn table with flexible shaft connection to the Filmo Projector, magnetic pickup, amplifier with power pack, tubes, needles, needle cup, pocket for three 16 inch records, and necessary accessories. The second case houses the loud speaker permanently mounted in the case itself, together with the Projector, three extra reels of film, empty reel, connecting cords, cables and accessories.

Talkies Increase Tax

A REPORT issued by the customs and excise commissioners shows that taxes on entertainments have increased 700,-000 pounds, or approximately \$3,500,000, during the past year.

This gain is recorded in spite of England's 5,000,000 pound drop in general revenue for the year.

The increase in entertainment revenue is attributed, in a large measure, to the large number of sound installations in theatres. Talking pictures are credited with bringing thousands of new patrons.



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Next!

DISTINCTION of being the smallest town in the world with talking pictures is now claimed by the village of Hayes, La. Sound equipment has recently been installed in the Magnolia theatre there, operated by Felix Herbert. The town's population is given as 80.

New Pathe Natan Paris House

PARIS—One of the two new Pathe Natan houses constructed on the Champs Elysees has been opened. It was originally planned to call the theatre, which seats 1,200, the Elysee Palace, but the name has been changed to Ermitage Pathe.

Start the New Year RIGHT!
Buy a
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Hal Mohr Picks Year's Cinematographic Plum

AFTER some thirteen years of preparation, the life of George Washington is at last coming to the screen. Sponsored by the United States Government and financed by C. H. K. Curtis, head of the Curtis Publishing Company, and Clarence McKay, of the Postal Telegraph Company, the picture will be started in February, according to present plans.

Hal Mohr, President of the American Society of Cinematographers, has been signed as Chief Cinematographer for the picture. Six months will be the shooting schedule, and Allan Crosland will direct. Belle Bennett has been chosen to play the role of Martha Washington, but no other members of the cast have been selected at this writing. Plans for the picture have been going along very quietly for some time and no publicity splurges have been made. Every effort will be made to make this the greatest picture of the coming year. Part of the picture will be shot in Hollywood and part in the East at Mt. Vernon and other locations.

Banks Directing Sixteenth

LONDON—Monty Banks is now directing "Show a Leg," his sixteenth comedy for B. I. P. in the past year. Leslie Fuller is enacting the title role, supported by Molly Lamont, Franklyn Silver, Sid Lewis and Alf Goddard.

Rex Ingram's First

PARIS—Rex Ingram, recently signed to direct for Paramount in France, will make as his initial vehicle under this banner, "Le Dieu De La Mer" ("God of the Sea"), at Saint Maurice.

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Stanley H. Twist



WORD has just been received that Stanley H. Twist has left the Bell & Howell Company, where he was general manager of the Sales Promotion Department, and has become Sales Manager for the Metal Specialties Manufacturing Company, 338-352 North Kedzie Avenue, Chicago, Ill. This concern builds the Presto Spray Painting Equipment.

Instead of facing the coming year with a frown and a feeling of pessimism, Mr. Twist and the Metal Specialties Manufacturing Company are putting into effect a well organized extension program, and predict an unusually successful year ahead. It was because of the desire to give this program a substantial start that Mr. Twist was secured as Sales Manager.

Mr. Twist has a long and successful record of both sales promotion and advertising to his credit, and his legion of friends wish him more than well in his new position, where he will be associated with L. W. Golder, Treasurer and General Manager of the organization.

Varanus Komodensis

(Continued from Page 13)

Tho to all outward appearances the reptile may look and act as a prehistoric monster, there is little reason to believe that he is any missing link or survivor of a lost period. Rather the evidence points to the fact that he is still in a period of development, and given a chance to feed, there is no doubt that he would grow to a far greater size than he is now, as has been proven by one which has been in captivity in the Soerabaja zoo for some years. Unfortunately for the Varanus, he has little food, and in consequence his development is retarded. According to the last information from Buitenzorg, there will be no more specimens allowed out of the country, as they are now making a survey and will no doubt in time turn the island of Komodo into a preserve.

Ruby Exchange Moves

RUBY CAMERA EXCHANGE, headed by Irving ("Ruby") Rubinstein, has moved headquarters to the second floor at 727 7th Ave., New York, where he now has the entire floor. The portable sound projector factory at Long Island City has also been switched to the new quarters.

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Photo-Electric Cells

(Continued from Page 17)

Specification of Characteristic

In gas-filled cells, on the other hand, the effect of voltage must be taken into account. For the standard gas-filled cells considered earlier, the current for some standard illumination (e.g. 0.1 lumen) at the standard voltage will suffice, but others will require more information. This information is often given by a series of characteristic curves of the cell (i.e. curves relating current and voltage) for a series of different illuminations. These curves are very useful and should be encouraged. The illuminations for which they are drawn should be standardized. When white light is to be used, the illumination should be given in lumens from the standard illuminants; curves for 0.001, 0.01, 0.1, 1.0 lumen are suitable. For cells to be used in the ultra-violet the illuminations are probably most conveniently stated in terms of the primary photo-electric current that they excite, so that the ratio of the ordinate to the figure marked on the curve gives the magnification due to gas-filling at the corresponding voltage. This method, however, is not wholly satisfactory. It gives the user more information than he wants—for a cell is seldom used at intermediate voltages—and it makes it difficult to take account of the inevitable variations between individual cells; it would be impossible to give a complete set of curves for every cell. It might be desirable therefore to supplement a set of curves generally representative of cells of a given type by some smaller amount of information relating to each cell. Thus there might be given the ratio of current to illumination

(1) at a voltage so low that it represents roughly the emission of the cathode,

(2) at the highest practicable voltage.

For (1) a voltage of 20 would be suitable; for though the current at this voltage is not always equal to the saturation current in the absence of gas, the ratio of this current to the saturation current does not seem to vary very greatly in cells of different types. For (2) it is necessary to define the highest practicable voltage. It might be taken as that at which the current increases by x per cent. (where x should be less than 10) for an increase of 1 volt in anode voltage, the illumination being so small that any further decrease of it does not change this figure. It is cleverly desirable to choose a small illumination for this purpose, because it is then that the maximum voltage is most important.

Other properties affecting materially the performance of the cell are the insulation resistance, the "dark current," and the stability. In any specification on which the acceptance of cells is to be based some account should be taken of these. The first two are, of course, to be specified in ohms and amperes respectively; the third, which is (or ought to be) important only in gas-filled cells, should be determined by the change in current over some period (say 1 hour) when the cell is subjected to a prescribed voltage and illumination; it is also necessary to determine whether the cell is or is not to be raised to its glow potential before the stability is determined, for the stability is usually greater if the glow discharge is first passed.

All-Metal Variable Gear Put Out by Link Belt Co.

A VARIABLE gear for speed transmissions, said to be the first all-metal product of its kind on the market and to consist of two pairs of wheels of the opposed conical disc type, between which a chain of special construction transmits power, has been put out by the Link Belt Supply Co. of Chicago. All the elements of this new mechanism are covered by an oil-tight housing which are automatically splash lubricated when in operation it is claimed.

Foreign Notes

Pathe-Rural Marketing Low-Price Talker Device

PARIS—Pathe-Rural, manufacturers of low cost projection equipment for silent films, 6,000 of which are now in operation in rural districts of France, is planning to market an inexpensive sound apparatus invented by Vial-Coutarel. This device will be adaptable for both silent and talker pictures, and will also enable exhibitors with present Pathe-Rural machines to change over to sound. In addition, the company will issue films in sound and silent versions.

Imitates Hollywood

A BUILDING company in the west of Berlin has changed its name into "New Hollywood, Ltd." and intends to erect studios, laboratories and dwelling houses forming parts of a future city near Berlin. These plans may not eventuate in the near future, since the company has no important financial backing; the originator is an enterprising builder and estate owner, Heinrich Mendelssohn.

Czech Industry Seeks American Co-operation

PRAGUE—Cefid, the motion picture co-operative society of Czech directors and artists, financed partly by the Czechoslovakian government, is making efforts to enter into connections with English film workers in order to establish common production of Czech and English talkers.

Audible Takes Second Welsh House

LONDON—Audible Filmcraft, which recently acquired control of the Lyceum, Newport, has now taken over the Pavilion, also in Newport. W. J. Wiffin, manager of the Lyceum, has been appointed general manager of the two houses.

Ufa-Emelka Plan Paris House

PARIS—M. Kohan, financier and member of the Emelka board of directors, is reported to be making plans for the building of a house here for the screening of Ufa and Emelka productions. Emelka, it is said, will first produce French and German talkers and then add English and Spanish.

New Kinema for Bournemouth

BOURNEMOUTH, ENG.—Plans are under way for the erection of a new Theatre Royal on Westover Road. The new house will be located next to the Regent, and opposite the Bournemouth Pavilion.

W. P.-Gaumont to Produce One

LONDON—Welsh-Pearson has joined forces with Gaumont for the production of "East Lynne on the Western Front." The film will soon be placed in work at the Shepherd's Bush Studios, under the direction of George Pearson, with Herbert Mundin as the star.

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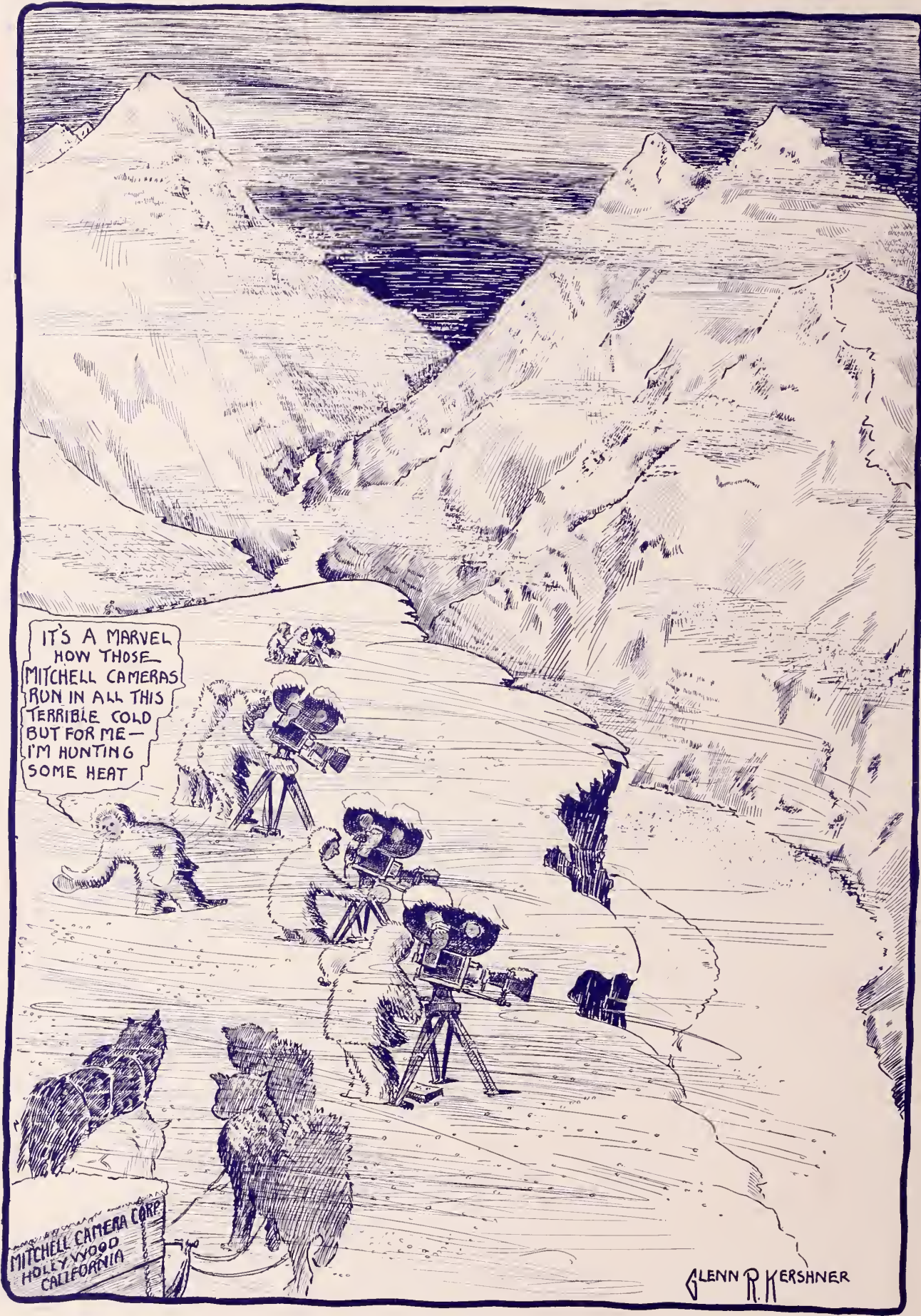
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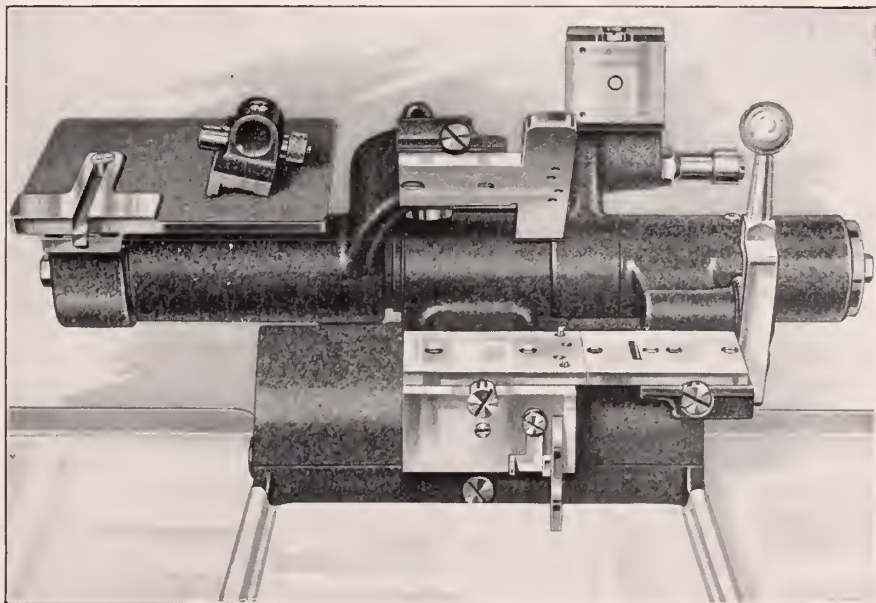
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Volume XI

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Number 10

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Irene Dunn, as she appears in the role of Sabra Cravat, first the girl, then the old lady, in

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We have seven orders in the plant at present and all the staff is working overtime.

We will have an interesting announcement regarding separate recorder and D. C. synchronous motors for your next edition.

Kindest regards,

A handwritten signature in black ink, appearing to read "Len. H. Roos".

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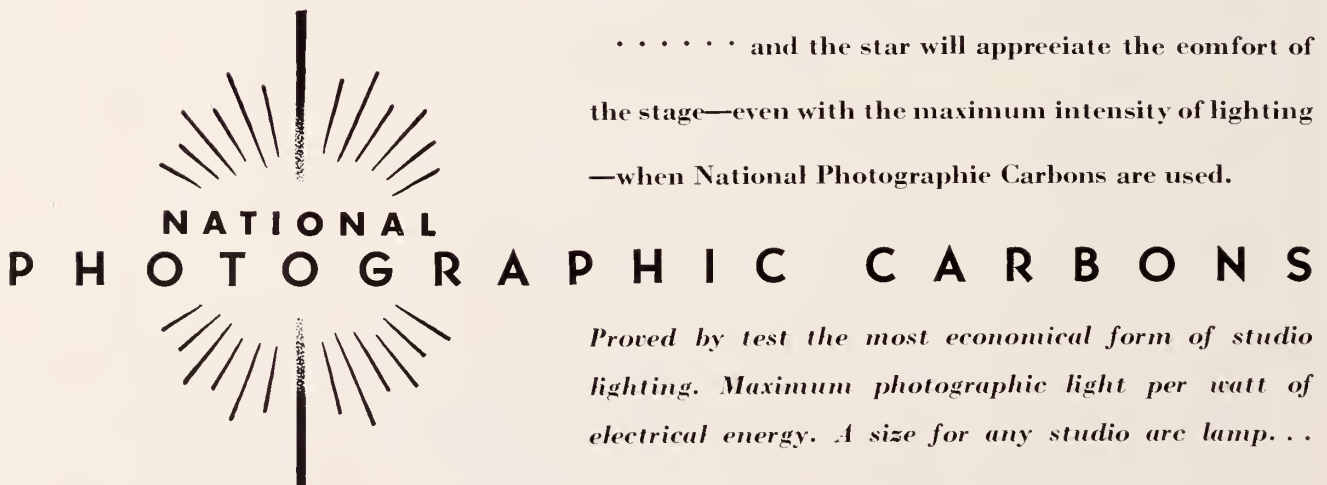


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BEAUTY SPOTS IN OLD MEXICO

SOME unusual photographs of this romantic country brought back by Mr. Mohr. 1. Some of the Pilgrims to the Shrine of Guadalupe. 2. An interesting street market. 3. A typical street in Cuenevaca. 4. Ruins of an old convent, rich in beauty. 5. The Pyramid of the Moon. 6. A roof-top view of Puebla. 7. A charming vista on a canal at Xochomilco. 8. Mr. Mohr in one of the charming gardens.

Mexico...the Wonderland

by **HAL MOHR**

President, the American Society of Cinematographers

TO THE ordinary United States citizen the name Mexico brings visions of revolutions in which the rattle of gunfire and the buzzing of bullets makes life a thing of more than passing excitement; of bold, bad bandits waiting behind trees to seize important looking foreigners for ransom purposes; of blood-thirsty individuals waiting to blow up railroad trains while the passengers sleep.

My job is not that of being a publicity man for Mexico, but after spending six glorious weeks in that marvelous country, I cannot keep quiet. I must shout that the world is wrong; that instead of being all the things so many people imagine, it is one of the loveliest spots that I have ever had the privilege to visit. And, as for bandits and all that rot—well, here is something to ponder over.

Mrs. Mohr and I were on our way to the station in Los Angeles at the start of our trip. As we passed a certain Los Angeles bank we noticed a big, armored truck in front of it. The truck bristled with guns. Three men, armed with wicked looking pistols stood guard on the sidewalk while several other guards carried bags of money into the bank. A crowd had gathered to watch it. The reason was because of the many bank holdups in our own peaceful community.

Now—the day we arrived in Mexico City this is what we saw: Walking down the street we noticed an old-fashioned, horse-drawn wagon stop in front of a bank. There were two men on the wagon. They both climbed down off the seat and started throwing bags onto the sidewalk. The bags were filled with money. When the load was on the sidewalk the two men each picked up a bag and walked into the bank, leaving the remainder of the money unguarded on the street. We watched this strange happening for some time. No one even stopped to look at the money bags. There were no armed guards. The money apparently was as safe as though the bags were filled with potatoes.

That is Mexico today. Quite a contrast to Chicago, say, or any of our large cities. The gunmen is an unknown quantity.

Mexico today is a country of progress. Rarely will you find a nation in which so much effort is being concentrated for the advancement of the people. And as for brigandage and revolutions; those are things of the past, and if the present administration has anything to do with it, will never be again. Every official of the country from genial and progressive President Ortiz Rubio on down is bubbling over with enthusiasm for the new order of things and a greater and more progressive Mexico.

Speaking of President Rubio brings me to one point that is an outstanding feature among the men responsible for the conduct of Mexican affairs. That feature is the hospitality and unusual friendliness shown the foreign visitor who is in Mexico either for real, honest business reasons, or for a friendly visit. None of these leaders hide behind a stone wall of under-secretaries, but, rather, they are much more easy of access than many petty officials of city or county organizations in our own country. As long as they know that you are not in Mexico for the purpose of "putting something over on them," that you are honest and decent, the hospitality of the nation is yours.

Contrary to the cries of certain individuals who continually try to stir up bitter feeling between Mexicans and citizens of our own country, there is no feeling against us. Instead, it seemed to me from my contact with Mexican officials, that the United States is the model which Mexico is following in its progressive development along educational and industrial lines. And great strides are being made in the matter of education. Schools and colleges are being provided, and compulsory education is doing much to raise the general standard among the lower classes. Hygiene is being given particular

(Continued on Page 25)



A typical bit of Mexican scenic beauty



Mrs. Mohr in one of the charming gardens

The Fate of the Iodide in the Development of Bromo-Iodide Emulsions

by **M. L. DUNDON** and **A. E. BALLARD**

Communication No. 417 from the Kodak Research Laboratories

IT IS commonly known that the high-speed negative emulsions contain silver bromo-iodide in which the iodide content may be from one to ten per cent of the total silver salt. It appears, however, that the simple question of what happens to the iodide on development has not been given the attention which it deserves. A search of the literature showed that Liesegang¹ has already suggested that the iodide in an emulsion may be quantitatively significant in its effect on the course of development because the iodide released would convert adjacent silver bromide into silver iodide. The purpose of this communication is to direct attention to the probable behaviour of the iodide during development and to show that such a behavior is in accord with experimental data. It is felt that this picture of the behavior of the iodide will be of value in interpreting certain development phenomena.

It has been shown by Wilsey² that the iodide atoms in bromo-iodide emulsions of the ordinary type are substituted for bromide atoms in the cubic lattice of the silver bromide crystal, thereby producing a strained condition which, as suggested by Trivelli,³ probably makes it more easily ruptured than pure bromide. Baldsiefen, Sease, and Renwick⁴ found that in a given emulsion the larger crystals contained a higher percentage of iodide than the smaller ones. As the larger crystals are usually more sensitive, and are exposed and developed first, if such crystals develop completely, their iodide must be liberated along with the bromide in the form of a soluble iodide salt. Renwick and Sease⁵ also found that the ripening process brings about gradual changes in the distribution of iodide in the individual grains, and stated that emulsified silver iodide added before mixing gives the same result as potassium iodide.

Because of the fact that silver iodide is less soluble than the bromide, the iodide is precipitated first from a mixture of the two halides. Further, if silver bromide is treated with a solution of soluble iodide, the bromide is rapidly replaced and silver iodide is formed. If, for example, a positive film is immersed in a one per cent solution of potassium iodide, within a minute the silver bromide is converted very largely to silver iodide.

When potassium iodide is added to a developer it diminishes fog very greatly, but only a small quantity remains in the developer after use, as it is rapidly taken out by developing film. On the other hand, Southworth⁶ has stated that a very small quantity of potassium iodide is effective in diminishing fog in strong developers, and that the decreased fogging action of used developers can be explained largely by the effect of the minute quantity of iodide taken from the emulsion during development. A small amount of iodide has also been used to prevent the development of abrasion marks, as the surface layers become iodised so quickly that surface development is prevented.

Probable Fate of the Iodide

With these facts in mind we can state the probable behavior of the iodide to be as follows. When a crystal of silver bromo-iodide develops, both the iodide and the bromide go into solution as the dissociated ions to form the alkali salt. In this form the bromide diffuses through the film, and most of it gets out

into the developer and remains there. The iodide, however, immediately replaces the bromide in any undeveloped grains in its vicinity, forming a deposit of silver iodide on their surface and freeing an equivalent quantity of bromide. Thus, those grains which have already started to develop continue, and develop to completion because of their large and growing nucleus. Undeveloped grains, however, especially those in which no development is taking place, are coated with iodide to an extent determined largely by the percentage of iodide in the original emulsion and by the number of available undeveloped grains on which the iodide may be deposited.

It seems logical that if single iodide atoms are interspersed among the bromide atoms in the crystal lattice, when development occurs such iodide atoms would be liberated along with the bromide. Once liberated, and in the form of iodide ions, they would not re-combine with silver to form silver iodide in the reducing environment of a developer. Further, they would be as free to migrate as the bromide ions and would be removed from solution only by substitution for bromide in a solid particle of unreduced silver bromide. With sufficient exposure and full development, if all the grains develop completely, the iodide must diffuse out into the developer or into an adjacent area of less exposure.

Experimental Data

The fact that most of the iodide in the original emulsion remains in the undeveloped portion when exposure is not complete was demonstrated as follows. Two pieces of film were carefully flashed and developed in caustic hydroquinone developer for five minutes. The flash exposure was so adjusted that at least two-thirds of the original emulsion was exposed and developed. Without fixing, the negative silver was dissolved by treatment with an acid solution of potassium permanganate and the manganese dioxide cleared out with sodium bisulphite. The residual emulsion on each film was then analyzed for the percentage of bromide and iodide, with the results given in Table I:

TABLE I

Sample	Emulsion	Treatment	Developable Percent	
			Density	Iodide
1.	Type A	Untreated	4.0	4.0
2.	Type A	Residual emulsion after development	1.02	17.8
3.	Type B	Untreated	3.80	1.25
4.	Type B	Residual emulsion after development	1.30	3.70

Thus it was established that after removing part of the available silver by exposure and development, the residual emulsion contained a much greater percentage of iodide than it did originally. In fact, it appeared that nearly all the iodide in the original film remained in that part of the emulsion which was left. The question still remained as to whether the iodide in the residual emulsion was there because the bromide had developed out, leaving a skeleton of silver iodide from the original bromo-iodide crystals, or whether the iodide had been devel-

(Continued on Page 22)

Eight Years Pioneering in China

by **W. H. JANSEN**

Industrial and Educational Films, Inc., Shanghai, China

FEW of us realize how little we know about any country other than our own, until after we have spent a considerable number of years in that country, and it is only by contact and experience among its inhabitants that one can grasp an idea of the actual conditions regarding the customs and manner of living of its people. No amount of printed news without picture illustrations, no matter how vivid the description, can convey to the imagination the true conditions as they appear through personal contact, and that which we see through our own eyes.

Next in value or importance to our eyes is that which we see through the lense of a camera, and brought to us in the form of a picture, especially the motion picture, bringing actual life before us, which has done more for us in the field of education than any other known device. America's foremost position in the world, one might venture to say, has been largely due to the advantage of having the world's wonders brought to her screens. The quoting of an old Chinese proverb: "one picture being worth 10,000 words" is proved by the following story of my eight years pioneering the motion picture industry in China.

Arriving in Shanghai in 1922, the motion picture activities, in the city termed the "Paris of the Orient," with a population of about one million, boasted in those days of about three "movies," and just a scattered few ramshackle galvanized iron affairs, way below the standard of our old-time converted store "nickelodeons" existed—in fact, they lacked the megaphone barker and old hurdy-gurdy piano in the lobby, and with the dim lights and a few hand painted posters made them very dismal looking places. The clientele of not more than about five of this handful of movie houses was made up mostly by Europeans or as termed in China "foreigners." The first two front rows of seats were set aside for the Chinese at 20 cents "small money," which was equivalent at that time to about 7½ cents in American money, and were rarely ever filled.

The pictures shown were mostly either "duped" copies or were picked up on the San Francisco market at about from \$5.00 to \$10.00 a reel, and many of them were resurrected from the "film morgues." Most of them had from one-third to a half of the story missing, so this will give you an idea of the average picture we had in "them good old days." So far as this story goes, it seems like history repeating itself, and brings us back to the beginning of pictures in America, but the difference being that this story is dealing with the conditions as recent as only eight years ago, whereas these so-called "good old days" existed in America as far back as twenty years ago.

Searching around for an opportunity in this field, I found that there had been only one previous attempt at making motion pictures in China, the effort being a series of 200 foot lengths of funeral and marriage processions and such other phases of native life.

Not being any too pleased with the prospects of this field, I was just on the point of making my departure for more fertile soil, when I received a note requesting my presence at the office of the British-American Tobacco Company. The next morning when I had my interview with one of the directors of this company, I was asked whether I would consider remaining in China if a satisfactory offer were made. Having already bought my ticket for passage to Manila, I was in a rather undecided mood, and more so when I was asked whether I could make cartoons. Up to this time I had never given a

single thought to a cartoon, or how it was made, excepting the enjoyment I remembered getting out of the old Mutt and Jeff series I used to see when I was in South America. After a rather lengthy discussion of the matter, I accepted the offer made to me, as I thought I could at least try anything once.

Without knowing the first thing about cartoon making, I found space in a garage, setting up my equipment I carried with me on my tour through India and Africa and on my general globe trotting, and proceeded to solve the mystery of mechanical action on the screen. Three months was the time agreed upon to produce my first cartoon. Well, it is too long a story to relate all the details of how I solved the mystery of this intricate work, but I can assure you that it is a true saying that there are more crazy people outside of asylums than there are inmates. However, it will ever remain a pleasant memory to me to have seen the enthusiasm shown by everyone concerned upon the showing of what I then considered my masterpiece, the subject of which was a donkey wagging its ears and refusing to move until it smelled the smoke of a cigarette its Chinese leader lit; the smoke spelling the name of the cigarette in the air, making the donkey roar with laughter, the motto being "Contentment for the smoker—contentment for the ass."

The exhibition of the donkey cartoon being declared a roaring success, and would meet with the company's cigarette advertising needs, it was agreed that I would continue, but I found my quarters far too cramped to meet the needs of what I had in mind for future development. When I suggested to the Company that I should have more adequate space in which to work, they were somewhat reluctant to expend to what I thought would meet the needs of the future.

Having been up to this time a resident for about three months, I had an opportunity to become more acquainted with the future possibilities China presented, and I decided that if the Company was not willing to put up something more like a studio, I would put it up myself, and instead of being in their employ, I would do the work for them, which would give me scope to promote that what I saw would in time be one of the world's most promising fields.

Leasing a roomy, old-fashioned house, I transformed it into quite an up-to-date miniature studio, which outgrew its usefulness in less than one year.

It then became necessary to seek a suitable piece of ground and erect one of the most modern and best motion picture studios that at that time could be found anywhere in the world outside of the United States of America. This splendid plant was built entirely of good hard brick and had hardwood floors, steam heat, and electric ceiling fans in every room. The studio consisted of an entirely closed stage, over 100 feet in length, dressing rooms, cabinet shops, scene painting department, and a lighting equipment of over 3000 amperes. The laboratory building was fully equipped, modern and up to date in every respect.

The product of these studios, in a little over a period of two years, was 191 reels, 1000 ft. length of town topics, 59 one-reel scenic pictures, 15 one-reel educationals, 6 two-reel comedies, and 4 feature length pictures, among them being the famous "Legend of the Willow Pattern Plate," the first Chinese film to be sold on the world market having its premier showing in London before Her Majesty Queen Mary and other members of the royal family. This film had a record of 263

(Continued on Page 26)

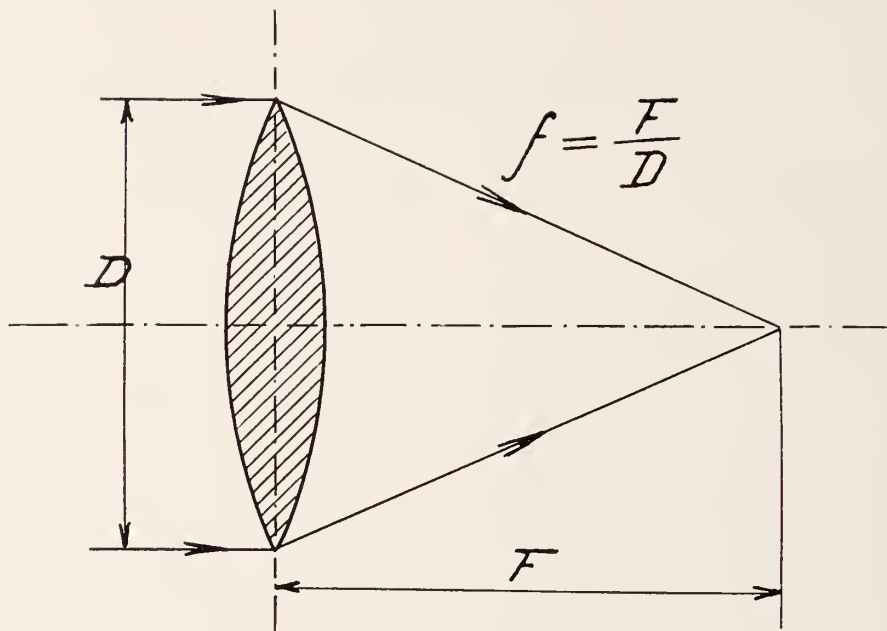


Fig. 1.

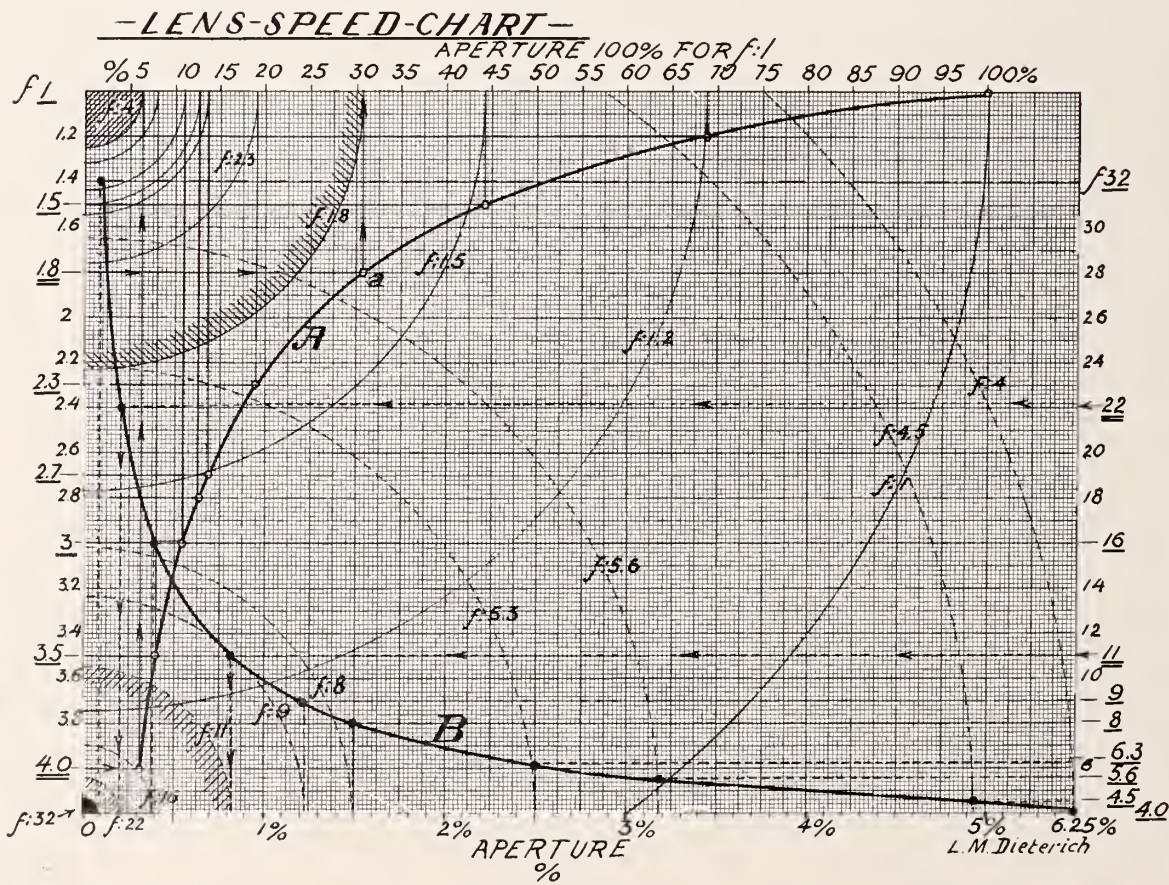


Fig. 2

Screen Definition

by **DR. L. M. DIETERICH**

Consulting Engineer

PART 4

FOR REASONS beyond the control of the author it was impossible to properly prepare for this issue the comparative test photographs necessary to show some classical results of proper filter applications.

This, part 4 of the analytical study of Screen Definition, is therefore published ahead of schedule. It deals with some of the optical details of motion picture lens construction, which should be understood by the practical cameraman in order that he may obtain correct exposures, so necessary for good screen definition.

One of these details relates to the proper handling of lens stops.

It is the intention of the following study to fully acquaint the adolescent cameraman with the relationship of lens speed or light transmission to the f values for which nearly all lenses are calibrated.

In Fig. 1 f is equal the focal value F of the lens divided by the diameter D of its working aperture. As an example: If a 50 mm (2") lens has a working aperture of 25 mm diameter then

$$f = \frac{F}{D} = \frac{50}{25} = 2 \text{ or it works at } f:2.$$

If the diameter of the selected stop should be 20 mm

$$\text{then } f \text{ would be } \frac{50}{20} = 2.5 \text{ or the lens would be working at a speed of } f:2.5 \text{ and so forth.}$$

The actual speed of a lens, however, depends on the amount of light that passes through it, and this again of the size of the circular opening of the lens system left uncovered by the stop. The area of this circle determines the amount of light passing through the lens and acting upon the film emulsion. The area of a circle of the diameter D is $A = \frac{D^2\pi}{4}$ or as the speed of a lens is in direct proportion to the area of its working aperture or stop it increases with the square of the diameter of such working aperture or stop.

In the above example a 50 mm lens working at $f:2$ has a working diameter of 25 mm or a stop area of $A = \frac{25^2\pi}{4} = 490.62$ square mm; working at $f:2.5$ it has a working diameter of $f:2.5$ or a stop area of $A_1 = \frac{20^2\pi}{4} = 314$ square mm or at $f:2$ it works about $1\frac{1}{2}$ times as fast as at $f:2.5$.

$$\left. \begin{array}{l} 490.62 \\ \frac{490.62}{314.00} = 1.56 \end{array} \right\} \text{ as fast}$$

It takes a great deal of practical experience to correctly judge lens speeds from the f value stops usually calibrated upon the lens barrels. To facilitate such judgment the author shows in Fig. 2 a diagram from which aperture areas (lens speeds) can be directly read for any f value.

At first glance this diagram looks rather complicated and may be bewildering to the non-technical cameraman, but the

author hopes that the following explanation will make it a reliable and easy workable tool for any cameraman.

On its left hand f values are shown from $f:1$ to $f:4$ and on its upper edge aperture area values in percent, starting on the upper right hand corner with 100% for $f:1$.

The method of ascertaining the correct lens speed for any f value between $f:1$ and $f:4$ is shown by two examples.

Locate $f:1.8$ on the f scale, follow its location horizontally (marked by arrows) until you strike the curve A. Follow from the intersection point a the vertical line (marked by arrows) upward until you strike the (aperture) speed scale and read the lens speed: in this case 30.86 or about $30\frac{3}{4}\%$ of the $f:1$ speed.

If you repeat this method for $f:4$ you strike the % scale at 6.25 or get a lens speed of $6\frac{1}{4}\%$ of that of $f:1$. If you divide $30\frac{3}{4}$ by $6\frac{1}{2}$ you get approximately 5 or a lens working at $f:1.8$ is about 5 times as fast as the same lens working at $f:4$.

On the right hand side of the diagram, Fig. 2, the f values from $f:4$ to $f:32$ are shown and using the corresponding curve B the relating lens speeds can be read on the lower speed scale.

$f:4$ is the start on this scale showing again 6.25% of the $f:1$ speed as read before the help of the A curve.

$f:11$, following the arrowed lines, gives on the lower scale a speed value of 0.82%, $f:22$ a speed value of 0.20% or a lens working at $f:22$ is about 4 times slower than the same lens at $f:11$.

The two f scales emphasize by underlining the standard f scale from $f:1$ to $f:32$ and the reading of their corresponding speed values is facilitated by lead lines.

The circles marked according to this standard scale enable the cameraman to get a quick comparison of the relative sizes of stop openings for the different stop numbers. For the above cited examples $f:1.8$ — $f:4$ — $f:11$ and $f:22$ these stop sizes have been partly shaded.

Fig. 3 shown on page 38 is a table which shows for the standard f values, used for lens calibrations, the corresponding lens speeds, or light transmission values in correct (column I) for practical quick comparison, sufficiently correct (column II) and according to the usual calibration scale on the multiple basis for practical purposes also approximately correct (column III) values.

Column III shows the tremendous difference in lens speeds for different f values and has been especially shown, because very often these large differences are underestimated by the average cameraman. This column shows per example a lens working at $f:1$ to be one thousand times as fast as the same lens working at $f:32$, at $f:3.16$ —one hundred times as fast and at $f:10$ —ten times as fast as at $f:32$.

The author hopes that this analysis and the diagrams shown herein may be of practical value and help to the cameramen at large and especially to those workers in the field of cinematography starting on the arduous and often discouraging road to become successful cinematographers.

In the next issue the author will try to present a practical manual for the use of color filters.



The Expedition to Aitutaki

by **PHILIP M. CHANCELLOR, A. S. C., F. R. G. S.**

The accompanying article by Mr. Chancellor is one of a series of reports he will give to this magazine during the coming year of expeditions to out of the way places in search of material for the Field Museum of Natural History. We might explain here that Mr. Chancellor had hoped to secure some unusual photographs of fish that are found only in the waters of that locality. But due to the fact that something went wrong with his specially constructed under-water camera, those had to be left for some future expedition. Last month Mr. Chancellor told us of the photographing of the Komodo Lizard.—Editor's Note.

however, excels most of them, and fortunately remains unspoiled, and lacks the prevalent commercial attitude.

We had hardly time to settle down, when a round of feasts and dancing began. For almost a year they had been practicing their dances, and they wanted to show them off. I may remark that these dances have not been given for about twenty years, and some of them have never been held since the "heathen days," before the missionaries. The missionaries, with their bigoted and insane ideas, have done their best to temper and spoil the dances, but they went on in spite of them. Each of the seven settlements had their own dances, and one by one they gave us a feast, and followed it by dancing.

The dinner was usually held at noon, and after the usual gifts of hats, pearls, mats, etc., dancing commenced. This went on without a break until about five, when it was stopped for tea. After that they were resumed, until it was too dark to see anymore. In the heat of their enthusiasm, they would not tolerate the stopping of a camera for a moment, even to change the film. It was futile to explain that I did not have a million feet for them, and they insisted that every incident should be taken. The solution was arrived at by loading some magazines with about four feet of film, and after taking such shots that were wanted, allow the motor to keep the crank turning. I do not mean to imply that they were in any way unpleasant, but they were too enthusiastic. Even when they realized that the camera was finished, they kept right on dancing, often until they fell to the ground.

One house was devoted to the cameras, and adjoining that was a darkroom for loading, and developing still shots. The

AITUTAKI is not at all a well known island. Indeed so little known is it that were it not for the chance of meeting the Resident Agent of Aitutaki, on a voyage from Tahiti to Wellington, I doubt that I should have heard of it at all. During conversation several things soon manifested themselves. Perhaps the first was that there were native dances there that had never been filmed, and the second was that there were fish there that had never been collected. Both of these were just what I was looking for, and so it was decided that Aitutaki would be the goal of the second expedition.

Thru the genial arrangements of the Government of New Zealand, our arrangements were made to stay there. We paid over an amount of money for the construction of our various houses, and for the leasing of land, for our camp. Also an interest was stirred up when they heard that one of the prime objects was to film the dances.

When we got there, everything was in readiness for our arrival, and we were greeted by about all the people of the island, as well as our old friend, the Resident Agent. Tho the feeling of hospitality is somewhat the same thruout Polynasia each island differs somewhat from the other in this respect. Aitutaki,



Natives ready for the dances.



Here they are in full swing for the camera.

water there was too impure to even consider developing motion picture film, and there was no possible way of cooling it. However I managed to make some good negative with a Lieca, which was the only still camera I had with me.

The humid climate and weeks of rain had a very devastating effect on cameras and lenses. Gelatine filters were fogged beyond use within about four or five weeks; even stained glass filters would become very fogged in their inside. The lenses

went the same way, tho they took a longer time to cloud. The film, however, kept perfectly, both the new stock which was sealed in cans, and the exposed negative, which I was careful to dessicate well, with dried paper, and Calcium Chloride. One of the cameras whose clearances were adjusted for work under normal conditions literally froze up, to such an extent that several of the steel parts, and all of the ball bearings had to be renewed upon return.



Mr. Chancellor does not say whether or not the turtle went into the ceremonial soup.

Manufacture and Use of the Thin-Film Caesium Cell for Sound Reproduction

by **L. J. DAVIES, B.A.**, and **H. R. RUFF, B.Sc.**

Engineering Laboratory, The British Thomson-Houston Co. Ltd.
Courtesy of the Physical and Optical Societies, London.

OWING to the increasing use of the sound film, the photo-electric cell now possesses industrial importance as well as scientific interest, and methods of manufacture have had to be established that will enable cells with uniform characteristics to be made in large numbers. The problems encountered in such work are somewhat different from those of a laboratory, since the efforts of the factory are concentrated on establishing schedules which will enable the production of the cell to flow smoothly and rapidly with a minimum of shrinkage due to failure in emission, or in falling outside limits previously defined. This production has to be performed, as far as possible, by non-technical labour but with skilled supervision.

The main users of the cell are Sound Reproduction Engineers, who have two main requirements that must be met. These are:

(1) The cells shall have a specified minimum sensitivity sufficient to operate the amplifier up to full output, and individual cells must not vary outside agreed limits.

(2) The sensitivity must be maintained substantially over long periods under operating conditions.

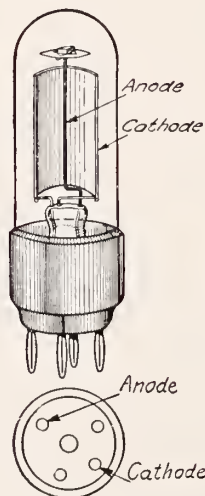


Fig. 1. Diagram of Cell, with plan of base.

Manufacture of Cell

The demand for cells for our own sound reproducers became sufficiently large to justify starting manufacture in the Lamp Works at Rugby. The type of cell being made is the red-sensitive, thin film caesium type. An outline drawing of the cell is shown in Fig. 1. In order to facilitate production the light-sensitive surface is formed on a separate silver-plated metallic cathode rather than on the glass of the cell. While the cell is being exhausted the cathode surface is oxidised and caesium formed by reduction of caesium dichromate and silicon contained in the small nickel capsule supported on the nickel rod forming the anode. The general construction of the cell is of a

simple nature, consisting of the semi-cylindrical cathode at the axis of which is placed the single wire anode. These two electrodes are assembled on a single stem and sealed into a small tubular bulb. Provided sufficient care is taken in manufacture, excessive leakage current across the stem is avoided, while the

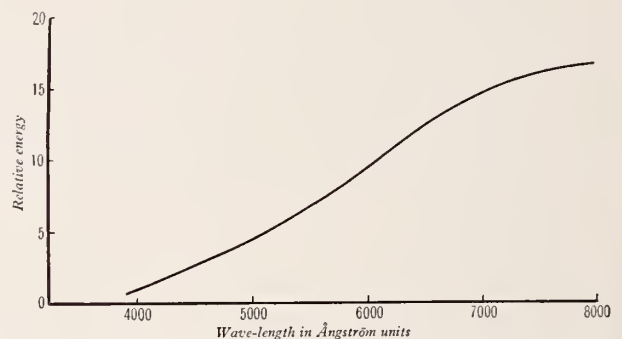


Fig. 2. Curve showing the relative energy of light of different wave-lengths emitted by a gas-filled lamp.

use of a single stem assembly makes for rapid production. The cells are exhausted on manifolds taking six cells at a time. Operators trained in lamp and valve work are being taught to perform the somewhat more delicate operations involved in the production of a photo-electric cell, and at present under skilled supervision are assembling, exhausting, activating, and testing cells. After tests in which the primary sensitivity and the gas amplification are recorded the cells are packed and placed in stores. They are then available for general sale, but the majority are sent without further testing to the cinema or theatre where the sound reproducing equipment is located. A small percentage of the stock is regularly withdrawn for complete testing, including life testing by the Engineering Laboratory. In addition the laboratory is responsible for the drawing up of the specifications of the cells and the design of the amplifying systems used with them. The manufacture of the cells is, therefore, now on a similar basis to that which has been used for some time with radio valves, and we feel that should the demand arise there would be little difficulty in manufacturing larger numbers. The harsh atmosphere of the factory has enabled the somewhat delicate and wayward photo-electric cell of the laboratory to grow up into the robust and amenable article of commerce, able to stand on the same terms as the other members of the vacuum tube family, the radio valves, rectifiers, X-ray tubes and lamps, already developed.

Importance of Red Sensitivity for Sound Film Production

The importance of a cell sensitive to red light for sound reproduction work can be realized from the following considerations:

(1) In order to ensure correct focussing on the film, and to fit in the space available in the sound head a small tungsten filament lamp is used as the light source. To secure

maximum radiation falling on the cell this filament is run at a temperature as high as possible consistent with a reasonable life. The relative energy radiated at different wave-lengths by such a source is shown approximately in Fig. 2. From this it can be seen that the greater proportion of the energy radiated is in the longer wave-lengths.

(2) The output of the cell is produced by the variation in light flux caused by the difference in transmission of clear and exposed film. An examination of Fig. 3 will show that with

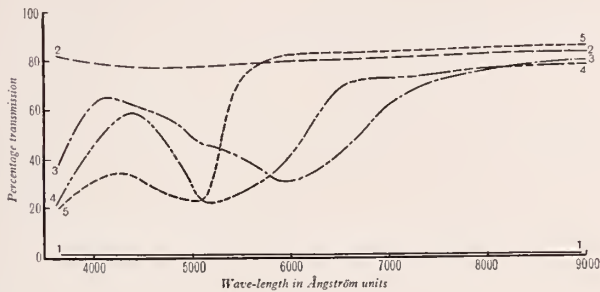


Fig. 3. Curves showing the transmission of films for light of different wave-lengths. 1, exposed film; 2, clear film; 3, bluish film to represent intense daylight; 4, film of red hue for fireside screens; 5, light amber film to give a golden effect.

normal film the difference in transmission between clear and fully exposed film is uniform over the band of wave-lengths 4000-9000 A., and therefore the long wave-lengths are fully effective. If the film stock is dyed, as is sometimes necessary, it will be seen that maximum difference in transmission occurs for all dyes only in the long wave-length region. Since the larger proportion of the radiation from the light source lies towards the long wave-lengths and since it is at these wave-lengths that the maximum difference in transmission is obtained for all types of films, it is clear that the cell should respond to these wave-lengths.

The wave-length sensitivity curve of the cell at present being made is shown in Fig. 4. This curve is taken by throwing

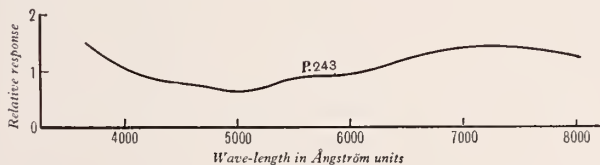


Fig. 4. Wave-length sensitivity curve for later production cells. Energy of light constant at all wave-lengths.

on the cell light of varying wave-length but constant energy and measuring the amount of photo-electric current produced. It will be seen that in the region 4000-8000 A. no sharp peak occurs, whilst maximum response occurs between 7000 and 8000 A.

Fig. 5 is interesting in two ways. It shows a plot of wave-length against photo-electric response of five cells selected at random from a batch of about 200 cells, representative of early manufacture. While a certain amount of variation exists, in general the cells can be said to possess the same wave-length sensitivity curves. It will be noted, however, by comparing the average of these curves with that given in Fig. 4, that later cells have been noticeably improved as regards red sensitivity.

If the energy wave-length curve of the light source is known, the photo-electric response for any cell to this source can be calculated by multiplying the ordinates of its wave-

length sensitivity curve by the corresponding ordinates of the light source curve. The response of the cell is then proportional to the area enclosed by this curve.

The improvement in output due to increase of red sensitivity is shown in Fig. 6 which has been obtained from a cell having a wave-length sensitivity curve similar to that shown in Fig. 4 and an earlier cell corresponding to the curve in Fig. 5.

It is a simple matter to demonstrate this improvement experimentally by throwing on the cell light of equal luminous

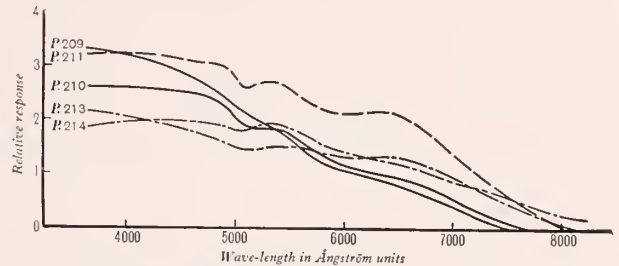


Fig. 5. Wave-length sensitivity curves for batch 1 of Mazda cells. Energy of light constant at all wave-lengths.

energy from a vacuum lamp and from a gas-filled lamp respectively. Since the eye is mainly responsive to the yellow-green radiation, the light from the lower temperature lamp will contain a higher proportion of long wave-length radiation than the light from the higher temperature gas-filled lamp since their luminous flux has been equated. The cell having the higher red sensitivity will show a greater relative response to the vacuum lamp.

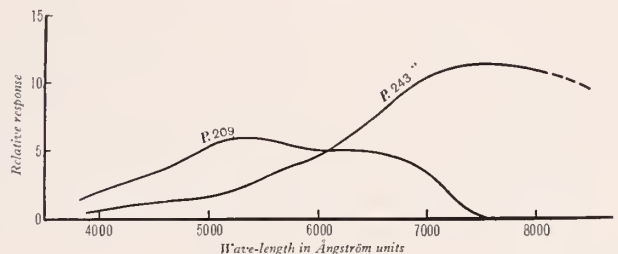


Fig. 6. Curves calculated from figs. 2, 4, and 5, showing relative response of two cells to gas-filled lamp. Response is proportional to area enclosed by curve.

Actually, of the cells shown in Fig. 5, Nos. P. 209 and P. 210 were rejected for sound film use when tested with a gas-filled lamp, although their response to day-light would be higher than cells having curves similar to Nos. P. 213 and P. 214.

We acknowledge with thanks the co-operation we have received from the Engineering Staff of the Lamp Works in the preparation of this paper, and we have to thank the Directors of the British Thomson-Houston Co., Rugby, for permission to publish it.

Acoustical Plastic Portland Invention

W. DUNCAN of Portland has developed a new plastic acoustical preparation, designed to eliminate echo. Plastic, it is said, can be applied to any kind of material with very little technical skill. It is extremely porous and has ability to absorb the sound waves to prevent reverberation, its sponsors say.

Hal Hall

S—A—Y—S



The Handwriting

AN ASSOCIATED PRESS news item appeared throughout the country the other day which should be food for thought for intelligent makers of motion pictures. We reprint it in full:

"BOISE (Idaho) Jan. 25. (AP)—Ray McKaig, chairman of the legislative committee of the State Grange, tonight issued an open letter to the State Legislature pleading with it to do something to stop the 'increasing flood of Hollywood filth' pouring into Idaho.

"Asserting there are many high-grade films produced, he urged steps be taken to eliminate the 'so-called sex pictures, the indecent exposure and sensual embracing and lewd remarks, which have about reached the limit.'

"'The State Grange, with other organizations in Idaho, appeals to the Legislature to do something to serve notice on the moving-picture industry that this sewage that is portrayed by word and vision on the screen in some of the films must be stopped,' the letter stated. 'I am not prude nor a Puritan, yet the indecencies portrayed and the filthy remarks made in some of the talkies are an affront to any kind of standards of American families'."

There, in a nutshell, is more than a mere straw which is blowing in the wind of revolt against pictures that try to get by on the sex angle. True, sex cannot be neglected. But neither can it be made the medium for gathering in riches for a chosen few from a vast amount of morons. Sooner or later it will bring an untold harm to the films. You may call people like Mr. McKaig narrow-minded. We will not argue that point. But we do feel that while blase New York and Hollywood may take the sexy pictures as something necessary to stimulate their blood, still New York and Hollywood are but a small part of the world in which our pictures are shown and from which the picture industry receives its money.

Congratulations

HANG up another cinematographic achievement for Clyde De Vinna, one of Hollywood's most capable camera artists!

This time it is "Trader Horn," the Metro-Goldwyn-Mayer epic which has been in the making for the past two years, and which is well worth waiting for. This man, De Vinna, has the happy faculty of giving us such cinematographic achievements. There was "White Shadows in the South Seas," for which he received the Academy of Motion Picture Arts and Sciences award; then "The Pagan," and now "Trader Horn." A really noteworthy accomplishment for this modest and retiring man.

And, to Mr. De Vinna's two associate cameramen, Bob Roberts, and George Nogle, we also doff our hat; for they had a big part in the photographing of this picture which was a photographic charm that calls for praise. Mr. DeVinna, chief cinematographer, and his two associates, have given us an atmosphere in this remarkable picture that they should be justly proud of.

Working under conditions that at times were almost unbearable in the African wilds, these three have stamped them-

selves as real artists, men who deliver no matter what the conditions. It is more or less a custom in motion picture circles to forget the cameraman when the publicity is being released. Just why, we have often wondered. So, this writer takes real delight in giving the mention due the cinematographers; and again—we repeat their names, Clyde De Vinna, Chief Cinematographer, and his two associates, Bob Roberts and George Nogle.

The Endless Chain

WITH the report that Chaplin's "City Lights" already has advance bookings totalling more than four millions of dollars, the motion picture air is filled with buzzings to the effect that the silent picture is again coming back into its own. Maybe! But—there is one thing producers must not forget—that there is only one Mr. Chaplin. We confidently say that Chaplin would score just as heavily in talkies. In other words, it is Chaplin—the great comedian, that the people want to see—whether he is silent or noisy.

And that leads us to the matter of the fads of the motion picture world. When talkies were first mentioned, and before Warner Brothers scored with Al Jolson, everyone declared that silent pictures were the only things—that talkies would never be any good, could never reach the heights of the silent drama. Then they switched about and everyone declared that talkies were all that mattered. Then came the color splurge. All turned to it whether they needed it or not. Then came the wide film fad. For a while it seemed as though pictures must fail unless a wide screen and film were adopted. But now the wide film is in the discard, and with the coming of a great successful silent drama we shall probably see many following in Chaplin's footsteps with silents—but they must not forget that there is only one Chaplin.

Musicals

IT BEGINS to look as though musicals are coming back. Let us hope so—that is, if they are good musicals. As we all know, the patient theatre patrons were simply drowned in musicals a while back. And some of them were terrible—and we are putting it mildly at that. Now, with Samuel Goldwyn's "Whoopie" paving the way, it looks as though there will be more musicals. There is no more reason for a musical flopping on the screen than on the stage. All that is necessary is a good musical. On Broadway a poor musical show closes in a hurry. Why not the same on the screen? So, if the producers will only give us good musicals a lot of us will be happy, and the box office will pick up, too.

The Answer

THE CRY from the theatre owners and managers for a long time has been to the effect that the motion picture theatre patrons have been conspicuous mainly by their absence. The matter at times has attained serious proportions.

The other evening this writer dropped down to Los Angeles to the Paramount theatre to see "The Blue Angel" for the second time. The theatre was jammed, and a long line of men and women extended nearly a block down the street—all waiting to get inside.

FORWARD!

The following is a message to American business from Herbert N. Casson, editor of Efficiency Magazine, London, England. We print it because of its inspiring thought; its call to Americans to rise out of the coma of depression and forge ahead. (The Editor)

"YOU are depressed. You think you are crippled. You are afraid of the future. You are full of fears.

"You have half the gold of the world and half of the machinery and most of the automobiles and all the skyscrapers.

"You have the greatest home market in the world and the largest corporations that the world has ever seen.

"You are ruled more by ideas and less by tradition than any other people in the world. You have usually done what you thought you could do.

"Now, can it be possible that a progressive nation of 120,000,000 people can be wrecked by the speculations of a little handful of fools in Wall Street?

"The prices that were forced too high had to come down. Today all prices are too low.

"There is now a golden opportunity for every man who has eyes to see it.

"Dollars are now being sold for thirty cents. Practically every security in the United States is now being sold at less than its value.

"The way to create a fortune is to buy from pessimists. Pay your money and take the risk.

"Frick started his career by buying coke ovens in the slump of 1873. Carnegie made \$300,000,000 by buying steel plants in slumps.

"Hundreds of fortunes have been made by buying from pessimists. Ye Gods, what a chance there is at this moment!

"In five years from now most American business men will belong to the 'I Wish I Had' Club.

"Then, it will be too late to buy a dollar for thirty cents. The opportunity will be gone.

"When a horse balks, the balk is in his head, not in his legs. He moves on when he thinks he will.

"And when an American business man is depressed, **the slump is in his head.** There is nothing serious to prevent him from making money if he thinks he will.

"When fear rules the will, nothing can be done: but when a man casts fear out of his mind, the world becomes his oyster.

"To lose a bit of money is nothing, but to lose hope or lose nerve and ambition—that is what makes men cripples.

"This silly depression has gone on long enough. Get rid of it. It is inside of you. **Rise and walk.**"

An Interview with Frank Capra

by HAL HALL

THE TIME is some twelve or thirteen years ago. The place is a power house over in Pasadena. The hour is four o'clock in the morning. It is raining in torrents. Nice and warm is that power house, and the engineer in charge smokes his pipe contentedly, while a young Cal Tech student dozes peacefully on a nearby stool.

"Frank," suddenly barks the engineer, "Better go out and see if that chimney is smoking again."

And the young man thus addressed rises, turns his coat collar up about his neck and trots out into the rain. He has to go a couple of blocks down the street before he can get a good view of the top of the chimney. By the time he has returned to report that smoke was coming in clouds from said chimney he is soaking wet, and cold. That was the third wetting the young man had received in as many nights, for it was the rainy season, and the City Fathers of Pasadena were poison as far as smoke from the power house chimney was concerned. So, the young man, a student of chemical engineering at Cal Tech, who was working his way through college, and who receives twenty-five cents an hour for working in the power house from three o'clock to seven each morning, starts thinking.

A couple of weeks later he aroused the curiosity, and the ire, of the engineer in charge of the power house when he started installing a peculiar looking gadget in the base of the huge chimney. It consisted of a selenium cell on one side of the chimney, and an electric bulb on the other. And when the next rain fell the young Cal Tech man did not have to go out and get wet, for the smoke would cut off the light and thus operate the galvanometer hooked to the cell, ringing a bell when the smoke would appear. The apparatus was so good that it is still in use in the chimney after all these years.

The young college student was Frank Capra, director of "Flight," "Submarine," "The Strong Man," "Rain or Shine," "Ladies of Leisure," and more recently, the big Columbia lighter-than-air picture, "Dirigible." And that practical turn of mind which made him devise the smoke detector in order to keep him inside in the wet weather, is reflected in his motion picture work and is more or less responsible for the unusual success that has been his in the brief time he has been in the business of making motion pictures.

He has been in the picture game only some six years, and in that time has reached a point that many men never attain, even with political and family "pull" and years of effort. The chief reason for his success, as this writer sees it, is the fact that Capra applies that cold, hard, logical reasoning of the man of science to his work. He abhors affectation, personal aggrandizement, slave bracelets, freak attire and the usual "show" that so many people in this business use to cloak inability—often stupidity.

"People want to see things as they really are," says Capra. "They are not interested in watching candles slowly soften and flop over into a wedding anniversary cake when the erring wife or husband fails to remember the date. This may be subtle symbolism. But candles don't do that in real life. What our audiences want to see are the characters. They want to see what the characters are doing. They do not want the characters blotted out by backgrounds that take up all of the attention.

"After all. The main thing in a picture is the story. If you have no story you have no picture. The degree of the success of the picture depends entirely upon the story. The story is given the audience by the characters on the screen who enact the roles of the characters in the story. Why, then, do a single thing that will take the attention of your audience from these characters and the story they are acting out?

"The suffering woman is the center of attraction, say, in one scene. The audience is interested in her and what she is doing, and what she is going to do. If you suddenly take their attention away from that woman by a kaleidoscopic whirling of unusual background the audience naturally shifts attention to the background and the story suffers. So, I have always submerged the backgrounds and centered everything on the players. Reality is what is wanted in pictures, not symbolic touches and beautiful settings for mere beauty's sake.

"This naturally brings me to the subject of photography. Photography is one of the most important elements in a picture, naturally. But to my way of thinking, the finest photography is not that which makes the audience forget the players and gasp at the sheer beauty of the setting, instead it is the photography that merges itself, so to speak, in the general atmosphere of the story. Photography that is not calling attention to itself is the finest photography. A cinematographer should know the story long before starting, and should get the mood of the story in his mind, and then keep his photography in the mood of the story from start to finish. A cinematographer can do more than any other individual in portraying the mood of the story, or he can do just the opposite. The good cinematographer portrays that mood, lights his picture so that the audience doesn't realize he has lighted it, gets over the proper effect so that the audience doesn't realize he has done it. In other words, the audience should never realize that a director has directed the picture or that the cameraman has photographed it. That is why "directorial touches" and photographic splurges should be kept out of pictures. Excellence in direction is reached when the audience never thinks of the director's work. Excellence in photography is achieved when the audience forgets photography. Excellence in the actor's work is attained when the audience forgets the player is John Smith, the star, and thinks of him as a living character on the screen. I feel that the time is past when a director can make a series of photographic settings of rare beauty and foist them on the public. The public wants reality and life and story. That is why a player who is not handsome or beautiful, but who is a real actor or actress, is such a success when given the chance."

Capra has his own ideas regarding dialogue. He doesn't like too much of it, and what there is must be good. Rather a wise thought.

"I believe," says Capra, "that there is too much small talk in a lot of pictures. Players chatter away at a terrific pace and most of the time say practically nothing. No wonder you see audiences squirming in their chairs. Sound is the greatest advance the industry has seen. But sound, like color, has its place. On the stage the characters are not always chattering like magpies. Usually the most tense moments of the drama are moments of absolute silence. The same is true in pictures. Dialogue where needed—and of the best—that is what is needed. But where the story can be carried without it—do not have conversation.

"The stage has been an institution that has come down through the ages. It will go on through the ages. The reason is because the writers of plays must give a play that holds interest. The same holds for the screen, although a lot of people do not seem to realize it yet. It takes time to write a story and a screen play. If you rush it you will have a poor picture. You cannot make pictures as you make soup, by recipe.

"And, as to players. Too much attention is being paid to the matter of voices. Less elocution, more real acting, and our

(Continued on Page 38)

1931 EASTMAN

PANCHROMATIC

TYPE TWO

EXCLUSIVELY



GLENN R. KERSHNER

The Fate of the Iodide

(Continued from Page 10)

oped and re-precipitated according to the mechanism suggested above. Therefore, in an attempt to answer this question, the following experiments were performed:

A medium speed film containing four per cent iodide (Type A) was fully exposed, and a total of eight square feet was developed in two litres of caustic hydroquinone developer without bromide, using the following formula:

Hydroquinone	12.5 gms.
Sodium bisulphite	12.5 gms.
Sodium hydroxide	25.0 gms.
Formaline	8.0 c.c.s.
Water	1,000 c.c.s.

The first sheets (5 inches by 8 inches, developed four at one time) were developed for ten minutes at 70° F. The time of development was gradually increased to twenty minutes as the developer was exhausted. Examination of the developed film by bleaching and clearing showed that a trace of undeveloped emulsion still remained on the film. The developer was found by analysis to contain in one litre halides equivalent to 0.118 gm. of silver iodide and 6.16 gms. per litre of silver bromide. As the original film contained four per cent iodide, and the developer contained iodide equivalent to 1.9 per cent of the silver halide, it was evident that under these development conditions about half of the iodide had developed and migrated into the developer. It seems, therefore, that even under less extreme conditions of development all the iodide must be developed from some of the grains.

In order to get an idea of the speed with which the iodide could replace bromide in undeveloped emulsion a piece of unexposed Type B film was immersed in a sample of the used developer from the above test. Fifty square inches of film were agitated in 500 c.c.s. of developer for five minutes, washed, and dried. On analysis it was found that the iodide content of this film had increased from 1.25 to 4.3 per cent. It is evident, therefore, that even with the small concentration of iodide present in this used developer the iodising action was quite rapid.

Another lot of caustic hydroquinone developer was used to develop eight square feet per litre of Type A film on which ordinary picture exposures had been made. The halide in this developer was found to be equivalent to only 0.016 gm. of silver iodide per litre and 5.27 gms. of silver bromide, an iodide percentage of 0.3 per cent, while the emulsion used had an iodide content of 4 per cent, thus confirming the fact that it was nearly all retained by the film.

Iodide in Developers

The above data shows that a very small quantity of iodide accumulated in the used developer tested, along with considerable bromide. This must be the result of an equilibrium between that part of the iodide which diffuses out into the developer, and that continually absorbed from the developer by undeveloped silver bromide. Of course, only a small part of the released iodide would ever diffuse out into the developer, as most of it, except on fully exposed and developed areas, would be retained in the film, as described above. This equilibrium value must be greater the higher the iodide content of the film used and the more complete the exposure and development.

The fact that developers conditioned by use give less fog than fresh ones is generally known, and has been confirmed in this laboratory.⁷ Southworth⁸ stated that the addition of 0.02 gm. of iodide per litre added to a fresh high contrast developer is very effective in diminishing fog. This is in accord with our experience that of all the methods by which we have tried to artificially condition a developer to diminish tank fog,⁷ the addition of 0.005 to 0.02 gm. of potassium iodide per litre along with the usual bromide appears to be the most effective. The

optimum quantity depends on the developer strength, as too much will retard both development and fog. With an ordinary carbonate developer, 0.005 gm. per litre is sufficient. The influence of oxidised developing agents in preventing aerial fog is not considered in this relation.

Conclusions

While the simple experiments described above may not be sufficient to prove the accuracy in detail of the phase of the development mechanism described, yet they do support it very strongly. There can be no doubt that in the later stages of development the composition of the residual emulsion in respect to the iodide bromide ratio is changing rapidly, and that the rate of change is affected greatly by the percentage of iodide in the original emulsion. Moreover, if the silver iodide is developed, and the iodide re-deposited according to the mechanism suggested above, a proper consideration of the mechanism is of great importance in the interpretation of many development phenomena.

Summary

A description is given of the probable course of the developer of bromo-iodide emulsions, whereby the soluble iodide liberated by development is re-deposited on undeveloped silver bromide grains. It was found that with partial exposure most of the iodide remains in the undeveloped portion of the emulsion, but with full exposure it can be leached out into the developer. The small quantity of iodide which accumulates in a used developer is a very important factor in its decreased fogging action.

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Electrotone Recorder Has Unique Features

LECTROTONE portable sound-on-film recording unit, said to embody some new and unique features, is a product of the Electrotone Corp. of Detroit, manufacturers of sound recording systems and electrical synchronization.

In this unit, mechanical light valves and glow lamps have been eliminated, while recording is possible with either variable density or area, as desired, through a simple mask change. In conjunction with this unit a patented electrical synchronizer is used. Through the use of this electrical synchronizer it is possible to have two independent shafts revolve at identically the same speed and maintain that speed for as long as desired. This means that a motor in Detroit can be regulated to the speed of a motor running in New York, or at any given distance, without any variation whatever, through radio control.

As recording of sound is done independent of the camera, through the medium of this electrical synchronizer, perfect synchronization is assured at all times, as for this particular application the synchronizer has been adjusted to exercise a complete and absolutely dependable check 12 times on every foot of film running through, the company states.

Jewish Talker Released

"SHULAMITH," Jewish talker by Abraham Goldfaden, has been released by Judea Films Inc. The silent film was produced in Palestine and music and singing added here.

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● **March American Cinematographer**

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1. An impressive altar in the great cathedral at Mexico City. 2. The beautiful and well-preserved altar in the ruins of an old convent. 3. A view of the entrance to the great cathedral. 4. Weird patterns are found on the canal waters of Xochimilco. 5. At the top of the world's highest auto road at Toluca. 6. A typical scene in Xochimilco. 7. A little bit of hidden Mexican charm. 8. A striking contrast in light and shadow in Puebla.

Mexico

(Continued from Page 9)

attention, and the results are rapidly resulting in advancement.

Speaking of hospitality, I must say something about the officials who for six weeks did everything in their power to make the stay of myself and Mrs. Mohr a visit which we shall ever remember with much delight. What we would have done without the hospitable guidance of Colonel Casimiro Talamantes, Chief of the Department of Investigation at Mexico City, I do not know. It seemed as though this magnificent host did nothing but try to make our stay a pleasant one. He guided us to delightful spots that we would probably never have thought of. He accompanied us on tours that will long remain stamped indelibly on our memories. In short, he was a magnificent gentleman.

Then, there was Benjamin A. Martinez, Chief of Identification and his excellent secretary, T. A. Gonzales, who took us on a tour of the police stations of Mexico City one night that was a revelation to me. And, that tour brought to light a condition that should be interesting to us of the crime wave belt. Not a murder, not a holdup was revealed in a period of twenty-four hours in that great city of hot-blooded Latins. Rather a fine condition of affairs. No wonder Senor Martinez and Senor Gonzales are proud of their country.

Jose Garcia Payon, Director de la Biblioteca y Museo del Estudio, was another who played no small part in showing us old Mexico. And Roberto Garcia, Oficial mayor de la Sria Particular del Gobernador del Edo de Mexico. The two accompanied us on some of the most marvelous trips of our entire visit. They took us on an auto trip up the highest automobile road in the world. That was in Toluca where a volcanic mountain rears its magnificent head 18,000 feet into the air. The auto road goes up 16,000 feet. What a trip that was. What scenic beauty! What photographic possibilities were revealed on every side! Indescribable!

Last, but not least, there were President Rubio and his capable Secretary, Colonel Jose Martinez. A charming man is Senor Martinez; and after meeting us, he reported to the President that we were in the city. Immediately President Rubio sent word that he would like to meet us. Imagine, a President so Democratic! And we found him an unusually alert, keen, kindly, progressive human being; a man who does not let the fact that he is President of a great country cause him to forget that he is after all a man. For an hour he discussed motion pictures with us. Wanted to know all the latest developments from every angle; showed a real insight into the business.

President Rubio is interested in the motion picture from not only the entertainment point of view, but from the educational angle. And he declared that any reputable person who was really respectable and honest, would find the greatest support in any effort he might make along motion picture lines in Mexico. They have practically nothing in the way of producing lines down there, but hope to see that develop in the future.

From my own feeble observations and my conversations with Mexican officials I would say that Mexico offers untold possibilities to those interested in production—provided they are honest and do not go down there with the idea of bunking the country by floating promotional schemes that will not hold water. The country is motion picture mad. Every picture house is crowded. Even the Indians in the back countries flock to the picture houses.

Sound has been installed in most of the theatres, and the general public has taken to sound in a thorough fashion. But they like Spanish versions. There is considerable objection to pictures in which every character speaks nothing but English. They cannot be blamed for that, for I am sure that pictures with characters speaking Spanish would not attract many of us to the theatres here.

Laurel and Hardy are the great picture favorites of Mexico, with Ken Maynard running a close second. The sign of Laurel



Colonel Casimiro Talamantes

and Hardy will pack any house in Mexico. In the silent days they liked them, but now that this comedy pair are speaking Spanish in the pictures that go to Mexico, they are doubly adored. The Mexicans howl with delight at this pair. They adore Ken Maynard, too. In fact, many with whom I came in contact, asked if it would not be possible to have him come down there and appear with his horse some Sunday in the great Bull Ring of Mexico City. I know that more than 40,000 people—the capacity of the Arena—would pack that place to cheer him. And probably as many more would jam the streets leading to the arena.

From a scenic and photographic viewpoint, Mexico is a veritable Heaven of delight. No matter where you turn you see subjects that make you want to set up a camera and just photograph endlessly. Magnificent old Aztec ruins that have come down through the centuries; cathedrals that are beyond the power of verbal description as to their gorgeous beauty; the famous floating gardens of Xochomilco; towering volcanic mountains, silent now, but ever carrying that threat of some day bursting forth with a shower of molten lava; the Thieves' Market; the ruins of the great convent at Acolman; Chocula, the town of 1000 inhabitants, but which boasts of 365 churches—one for every day of the year; Cuenevaca and Puebla, towns of exquisite charm and photographic beauty. One could go on indefinitely.

One of the real garden spots of Mexico is at Xochomilco. This suburb of Mexico City originally was built on marshes and swamp. It was a Mexican Venice, with waterways as streets. And then, they constructed rafts and upon them placed dirt taken from the beds of the waterways. On these were planted gardens. As time passed these rafts became covered more deeply with dirt; trees were set out and their roots extended

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Eight Years In China

(Continued from Page 11)

bookings in Great Britain and Ireland alone, and in March, 1930, was still being shown at the Piccadilly Theatre in London, four years after its original release in that city.

From these personal efforts came the general knowledge of cinematography to China, and was the incentive for the formation of 48 actual Chinese motion picture companies during 1925, exactly three years after my commencement of activities. These general activities in the motion picture field resulted in the increase of Eastman Kodak Film sales from less than 5000 feet to over 1,000,000 feet per month. The peak for film sales has reached over 2,000,000 feet per month, the standing order regularly shipped from the Eastman Kodak Company plant at Rochester for use in my studio alone being 60,000 feet of negative and 200,000 feet of positive film per month.

The purpose of this great motion picture activity was for the promotion of cigarette sales, and the method used for advertising of the various brands of cigarettes manufactured by the British-American Tobacco Company was by having the name of the particular cigarette in a small frame at the foot of the subtitle.

We were the first producers in China, not only to make films, but the first to use the native language in the sub-titling of our pictures. Owing to the increase of Chinese patronage we find today more than 200 very fine theatres with more in construction. The largest and foremost of these having the most modern cooling and heating systems, and some with a seating capacity for 3000 people.

In fact, the Chinese have now become such "movie fans" that the major American and European film producers have set up their offices in Shanghai, with branch offices in almost every city of importance in China.

As a further example of the business being done today "All Quiet on the Western Front" broke all previous box office records by grossing nearly \$200,000 (Shanghai currency), seats being booked a week ahead, and the first time Sunday morning showings had ever been resorted to to handle the crowds, and it might be said that 80 percent of this gross total was from Chinese.

By the middle of this year there will be more than 40 major theatres wired for the talkies.

It requires very little imagination to see what influence motion pictures have had toward the Westernizing of China, and as the Chinese are now at the inception of a modernization of their society and are receptive to influence from without, I know of no agency that can be more helpful in hastening the transition as an educational factor in all its varied aspects as the sound and color films, for which purpose I am now in America to re-equip my studio with most modern sound equipment, and the establishment of the Multicolor laboratory. With these two new factors to work with, it will be possible to open up many new avenues for education, which I predict within the next five years will open up a vast market for many of America's surplus products.

Besides making this trip for the purpose of purchasing new equipment, I am also inviting American manufacturers to subscribe industrial and educational films, as a part of my educational program, as the contribution of films of this nature will be the means through which America can give its message of good-will to the people of China.

The following excerpt from a letter sent me by Mr. H. C. Mei, of the Chinese law firm of Mei and Liu, Shanghai, gives an idea of what the progressive Chinese think of the influence of the motion picture. In part he says:

"I believe that properly diversified, carefully selected and really informative films of Western scientifically organized industries will provide a mental stimulus and make a social effect of farther reaching value than all the political and other

propaganda that has in recent years been directed towards the hinterland of China."

Since this story will appear in THE AMERICAN CINEMATOGRAPHER especially published to meet the motion picture industry, I would like to give a little advice to them for their future good in their business relations so far as China is concerned:

In the first place we would draw to the attention of the directors, story writers, dialogue and title writers, that when they design a picture, to forget that America represents the whole world. In making up their picture they must forget that the queue, commonly known in this country as the "pig tail," now belongs only to a picture which deals with some historical period of the life of China, previous to the abolition of the Chinese monarchy. Today one rarely ever finds, except in the most remote parts of China, any one wearing a queue, and our writers and directors should remember that it is natural to suppose that the bulk of the Chinese audiences patronizing American pictures (more especially today since they have to listen to dialogue in the English language) are educated Chinese. Therefore, any reference made to them by the use of the word "Chink" would naturally offend them. In pointing out the educational value of motion pictures, it behooves the industry to pay a little more attention to these matters, and I would also point out that for the few dollars represented in that market we cannot afford to have our prestige destroyed through a number of pictures dealing with the sex question, which paints us before the eyes of the now many million Orientals as being an immoral race. Creating this feeling certainly does not assist those pioneers representing our industries in establishing that harmony and good feeling so necessary in dealing commercially with those people.



W. H. Jansen

Mr. W. H. Jansen, writer of the above article about motion picture development and conditions in China, is head of the Industrial and Educational Films, Inc., Shanghai, China. He formerly was well known in American motion picture circles as a cameraman. For eight years he has been in China and has photographed about every conceivable kind of picture over there. At present he is in the United States purchasing sound, laboratory and camera equipment and making various contacts with releasing and producing organizations. Anyone wishing to learn anything concerning the picture business in China may write Mr. Jansen in care of this magazine, and he will be pleased to give any information possible.—Editor's Note.

ELMER G. DYER

A. S. C.

did the
AERIAL CINEMATOGRAPHY
on

COLUMBIA'S

.. BIG AIR SPECIAL ..

'Dirigible'



JOSEPH WALKER, Chief Cinematographer

FRANK CAPRA, Director

National Lamp Works Holds Premiere of First All-Color, All-Talking Motion Picture for Industry Use

Photography by Alvin Wyckoff, A. S. C.

"STEPPING AHEAD," the first all-color, all-talking motion picture produced for use in industry, had its premiere on January 12, at the General Electric Lighting Institute at Nela Park, Cleveland.

An audience composed of nearly a hundred National Electric Light Association Merchandising Committee members joined with Cleveland Electric League officials, publication representatives and Nela Park officials in voicing enthusiastic approval of the production which, it is expected by officers of the National Lamp Works, the film's producers, will now make possible the presentation of the company's merchandising story in sections of the country which hitherto have been difficult to reach.

"Stepping Ahead" is a fast-moving vehicle for the offering of the National Lamp Works' 1931 merchandising program. Through its combination of motion, music, voice and color, it presents the potentialities of the lighting market, and shows how the National Lamp Works is equipped to assist its Agents to capitalize the market. In addition, it shows, in a form that every lamp seller can readily understand and apply, the best sales methods for increasing lamp sales and how they result, in contrast with those methods which in the light of merchandising research, are no longer considered good practice.

The opening scene of the film, accompanied by a spirited busy thoroughfare. The speaking voice of the film relates how in man's forward march of progress, he is stepping ahead to the better things of life, and is doing more in less time than ever before in the history of civilization. The scene quickly fades into sequences in which first a railroad train speeds toward the audience, then an airplane taking off from a landing field. As with higher speed it approaches closer and closer to the audience, the sound of its whirring propellor growing in volume, one realizes, as the film announcer points out, that man's new conquests have eliminated the fetters that impeded his ease and celerity of movement in former years. "This is an age of speed," the film voice says, "and man has attained a new-day freedom of motion of which our ancestors never dreamed."

The remainder of the first reel is devoted to picturesque colored close-ups identifying various lighting markets. A charming home setting, with beautifully gowned women, luxuriating in the warm, restful glow of flame-tint light, is shown. In rapid succession are depicted the vast Sunlamp market, with intimate close-ups of busy executives; tiny babies gurgling in the warm rays of artificial sunshine; and the Sunlamp-lighted Chicago studios of the National Broadcasting Company, with a radio recital in progress. The newly developed Photo-flash Lamp, General Electric's new contribution to the photographic art, which makes possible the finest flashlight pictures without smoke, noise or odor, is next demonstrated in actual application. Times Square, with its surge of humanity and colorful electrical advertising, is next revealed.

Part two of the film, which is a two-reel production with appropriate music throughout, shows a flashback to the days when the incandescent lamp was a novelty. A demonstration of an attempted lamp sale of those days shows an over-anxious store keeper losing a sale to a disgusted prospective lady customer, through his clumsy sales tactics. Then follows the story of the National Lamp Works' organization twenty years ago, with its inception of nation-wide advertising which, like the snow which is shown falling on a miniature city, has blanketed

the country and caused the present widespread consumer acceptance of General Electric MAZDA Lamps.

The National Lamp Works' Four-Star Merchandising Program for retail Agents is then dramatically presented. The Agent audience is urged to follow the Four-Star Plan for increasing their lamp sales through consistent use of: 1. Attractive Window Display; 2. Harmonious Interior Arrangement; 3. Effective personal salesmanship, which involves selling lamps by the carton of six instead of two or three at a time; 4. Going out after consumer contract business. Actual demonstration of the right and wrong way to sell lamps puts over this angle of the story with a punch that only a colored motion picture talking film employing trained actors makes possible for general presentation.

The picture ends with a dramatic review of the possibilities of the lamp and lighting market and the powerful urge to "Step Ahead with General Electric Mazda Lamps."

H. H. Green, former Advertising Manager of the National Lamp Works, and now Assistant General Sales Manager, who conceived the film and wrote its continuity, feels that "Stepping Ahead" will enable the National Lamp Works' field organization to tell a better story to a wider audience than has been possible heretofore. He points out that whereas a sales specialist might make a tour of the country, covering the larger cities and speaking to a number of groups of Agents, such a method has always taken weeks and months of time, the schedules have been difficult to arrange, and individual speakers have found it practically impossible to maintain a consistent excellence of presentation. In addition, it has been expensive and cumbersome to transport a group of trained actors and the large amount of "props" and display material. The film, he feels, solves these difficulties, since it tells a consistent story of uniform excellence, and may be shown before one person or a thousand, at any time, and at any place.

It is planned to release additional films for sales, educational and promotional work throughout the country as field conditions warrant their issuance. The various sectional sales divisions of the National Lamp Works throughout the country are being equipped immediately with projectors and sound equipment.

"Stepping Ahead" was produced by the Industrial Division of Multi-Color, Ltd., Chicago. The scenes were photographed in California, New York City, and in the film laboratories of the General Electric Company at Schenectady by Alvin Wyckoff, who has done a splendid piece of color photography.

DeForest Radio Develops 2 Photo-Electric Cells

DEVELOPMENT of two photo-electric cells, numbers 602 and 668, has been announced by the DeForest Radio Co. of Passaic, N. J.

The DeForest photo-electric cell No. 602 is said to be of the potassium hydride type. The active surface is deposited upon the inside wall of the bulb as a cathode, while a wire ring in the center serves as an anode.

Cell No. 668 is of the caesium argon type. The active surface is deposited upon a half cylindrical silver-plated cathode, while a straight wire at the axis of the cathode serves as an anode, it is claimed.

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Staub Honored

RALPH B. STAUB, who made the first interior scenes of Alaska in the Mt. McKinley section about 10 years ago, when he was about the youngest cameraman in the business, has received word from friends in Alaska that a river up there has been named in his honor. It is called Ralph River.

Frenchman Invents Metal Film

METAL FILM, claimed to be more durable and resistant than the present celluloid preparation, and to be of equal lightness and efficiency, is reported to have been invented by Louis Lumiere, French scientist.

Remote Control for Theatres

REMOTE control for sound, enabling a theatre manager to dispense with cue sheets, buzzer signals, telephone calls, etc., and to regulate quality as well as quantity of sound from a down-stairs position without interfering with the work of the projectionist, will soon be available to all theatres. The device, called the Strong Remote Volume Control, and patented by L. D. Strong of the Essennay Electric Manufacturing Co., Chicago, has been approved by RCA Photophone and will first be installed in RCA equipped houses. Later it will be ready for adaptation to other makes of sound equipment amplifiers. The Essennay company is now turning out the devices for RCA Photophone.

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Amateur Movie Making

◆ by HAL HALL ◆

JUST as we were settling back in our well known lethargic manner, happy over the fact that a new year had started with a rather rosy outlook, despite prevailing conditions, our worthy and estimable associate, Mr. William Stull, decided to surrender to some wandering microbe that came in with the above-mentioned new year.

In other words, Mr. Stull, who conducts this Amateur department in such an interesting manner, became very ill and, while he is on the high road to recovery now, still is unable to resume his work. So, we have taken it upon our self this month to attempt in our feeble way to take his place. We are sorry for our readers, for taking the place of William Stull is an order that we fear is much too large for such an individual as Ye Editor of this magazine.

We are particularly fortunate in having the services of Mr. Stull in the Amateur department, for he is an unusual editor, in that he writes entirely from experience. Most of us are too busy editing to actually do anything in a practical way. But Mr. Stull, a capable man with the professional camera, spends hours with the 16 millimeter camera wandering far afield at times in his search for subjects that are unusual. Some day we hope to persuade him to allow us to have some prints made of some of his 16 millimeter subjects and pass them along for our readers to view in their own homes. His pictures are revelations to a lot of amateurs—and when he reads this he will probably tell this writer that he is passing out misinformation. But, be that as it may, we are certain that his shoes are a bit too large for this writer to fill. In fact we feel ourselves slipping around already. His physician says that he will probably be back on the job in time for the March issue. We fervently hope so. And now to get to the work of filling his space in this department.

Panning

The other evening we dropped in on a friend who has been asking us for months to come and see some of his 16 millimeter stuff. We use the term "stuff" purposely, for that was just what it was. A beautiful scene would appear on the screen. But—not for more than two or three seconds. Then SWISH! Our eyes would almost flop out as we tried to follow the camera. He was what this writer likes to call a "panning hound." And such panning. The results gave the impression that he simply swung the camera around in an arc much as though he were swinging a bucket of water which he knew would spill if there was not sufficient speed in the swing to hold it in the bucket.

Practically every subject he showed was spoiled by this very business of panning. Apparently he was trying to take in the entire world in each shot. This seems to be a major fault with users of 16 millimeter equipment. In the past year this writer has looked at more shots of this nature than he ever hopes to see again in all his life. Why, oh why, do amateurs do this! Why not select your shot and make it artistically and let it go at that! Why get the idea that every shot must take in all the surrounding territory!

Perhaps the reason for this is the fact that in the pictures we see in the theatres we so frequently see follow and pan shots. But you never see them done so hurriedly as to make them monstrosities. The cinematographer who makes them has his camera on a tripod with a special head constructed so he

can pan steadily. If he attempted to pan without the tripod and the necessary equipment he would ruin a shot that otherwise is very effective. Holding a camera in the hand is unsteady and difficult enough anyway, without trying to swing in an arc that takes in half of a city. So, take this writer's advice, Mr. or Mrs. Amateur, and pan less and more slowly and more steadily.

Picking Your Subject

Another outstanding failing among amateurs, and we seem to be in a super-critical mood today, is in the selection of subjects to photograph. What a joy it is to sit in some amateur's home and look at their pictures! And—what a bore to sit in the homes of some others! The chief difficulty seems to lie in the fact that most amateurs use their motion picture camera the same as most people use their still kodaks for the first time—just snap at any and everything in sight. In the first place, this is a decided waste of film, for there is so much we photograph that is not worth a snap of the finger. After the first excitement and novelty of making pictures that move is passed, it is well to take stock of what we have done with the idea of improving in the future. Refrain from shooting pictures just for the sake of shooting. Look about for the interesting, the unusual—for something that will be of interest next year, or perhaps five years from now.

For example. Suppose you live in Boston, or its suburbs. You have a full year's work cut out for you if you sit down and plan out a scenic picture that will take in the historic places of Boston and surrounding territory. But, do not just start out shooting. Plan what you are going to do. Figure what you are going to photograph first, study the subject from every point of view so that you will secure the best and most interesting picture of it. Concord, Lexington, Bunker Hill, the Old North Church—why, there is a wealth of marvelous material there. But photograph it with an eye to making a picture that, when blended together, will be a picture that will give a stranger an intelligent view of this historic city. Then, title it intelligently. You will have something really worth while. Incidentally, such a picture, well done, might be the means of turning many good American dollars into your purse, for such a picture has educational value, and if properly done and properly marketed can be sold.

The same possibility is found in Philadelphia, Gettysburg and countless other places. Think it over, and you will be making some scenic pictures that will surprise you.

One feature that will improve your pictures is the matter of titling. So many people go on a trip, shoot a lot of scenes and then piece them together and run them in a haphazard manner, with titles that tell practically nothing. It is a simple matter to take the same scenes, arrange them in more or less orderly sequence, and then title them so that they tell a story from start to finish. For example, you start with a shot of a foreign city as you first enter. Explain this in your title and then go on with the idea of continuity in mind. You tell the story in your titles and portray it in your pictures. Much pleasanter to the eye of the folks at home than a jumble of shots that you have to explain yourself as the picture is being shown. In other words, take a leaf from the note-book of Burton Holmes. You know how interesting his pictures are.

(Continued on Page 41)

NEW...The B & H PHOTOMETER

◆◆◆ for still camera requirements ◆◆◆



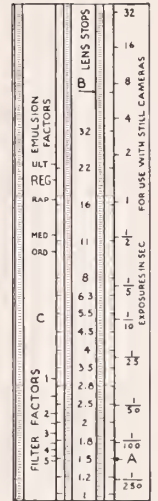
The B & H Photometer, first introduced for gauging exposure for Filmo movie cameras, is now presented for use with "still" cameras. "Matched illumination" remains the basic feature of the new B & H Photometer.

This new Photometer gives scientifically correct exposure readings in terms of lens stops from F 1 to F 32, shutter speeds from 32 seconds to 1/1000th of a second, emulsion factors from "ordinary" to "ultra-rapid," and filter factors from 1x to 5x.

You press a button, sight through the

eyepiece directly upon your object, and turn the dial. Then take your lens stop reading direct for any shutter speed you wish to use—or vice versa. Modification for different filters and emulsions is obtained by moving the respective scales to the desired point.

The new "Still" Photometer is easily the most radical advance in exposure meter design and operation in years. Write for special literature. B & H Photometer for still cameras (Model B), \$20 with case, \$17.50 without case. Model A, for Filmo Cameras, same prices.



(Left to right) Ring C, for filter and emulsion factors, Ring B (stationary) for lens stops, Ring A for shutter speeds.



No Filmo has ever ◆◆◆ worn out ◆◆◆

Gen. Milton J. Foreman, soldier and world-traveler, has put his Filmo, now more than 5 years old, to the severest test, carrying it on his extensive travels throughout the world. It has served him loyally, like the veteran it is, giving him reel after reel of theater-clear movies, with never a balk, never a failure.

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Please mention the American Cinematographer when writing advertisers.

Portrait Pitfalls

By **Lawrence Grant**

Mr. Grant is one of Hollywood's best known character actors. Photography is his hobby, and his portrait work is considered among the finest. As a pictorialist he also claims distinction. In the future issues of this magazine Mr. Grant will contribute a series of interesting articles, with his own illustrations.—Editor's Note.



TRADITION has it that, many years ago, an aspiring young photographer asked Edward Steichen, then, as now, the dean of American camerists, what was the secret of making artistic pictures. And to this question, tradition tells us that Mr. Steichen responded, "Simply make them easy to look at."

There is a great deal of truth in that definition. Photography, whether professional or amateur, is primarily a means of making accurate and pleasing representations of whatever may lie before the lens of the camera. In its ability to do this lies both its commercial value, and its claim to artistic standing. Being a basically mechanical process, its accuracy is unquestionable, while the fact that it can, in a great measure, be controlled by the individual photographer indicates that it can be made to make pleasing pictures of almost any subject—which gives it a place among the arts.

Unfortunately, however, this matter of individual control can be gravely exaggerated. Furthermore, it is being exaggerated,

in too many instances, to the point where individual artistry is giving place to affectation. Now, this development is quite permissible in the purely amateur field, but in the professional field—particularly in the case of portraiture—it becomes definitely bad. In my own personal opinion, as one who has striven and suffered on both sides of the camera, it seems very clear that the sole object of a professional portrait should be to give the best and simplest representation of the sitter; in other words, Mr. Steichen's picture which is "easy to look at." It should be a tribute to the appearance and character of the sitter, and not—as is so frequently the case today—a tribute to the "cleverness" of the photographer.

During the course of my many years in the motion picture industry, I have had the opportunity of discussing photography with most of the outstanding directors, cinematographers, and critics of the day; and the consensus of their opinions has been that the most perfect and artistic photography is that which is invariably simple and unobtrusive. If this is so in the matter of cinematography, why should it not be equally applicable to portrait photography? In the language of the industry, why should a personal portrait serve to publicize the photographer, rather than the sitter? In painting and sculpture we find great artistry invariably characterized by simplicity and concentration upon the subject, letting the attention be focused upon the subject, rather than the artistry of the maker. In cinematography we find the same thing. But in photographic portraiture, we all too often find ourselves lost in a maze of trick lightings, bizarre compositions, and bewildering camera-angles, all of which may increase our esteem for the ingenuity of the photographer, but which certainly do not bring the picture any nearer to Mr. Steichen's ideal of one that is easy to look at.

Probably the greatest offenses are committed in the name of composition. Now, obviously some attention must be given the arrangement of the component parts of a picture, but it has always seemed to me that to go about it with the idea of making a perfect S-composition, or a perfect triangle-composition, or anything of the sort, was rather putting the cart before the horse. If you can arrange your subject so that it makes a pleasing picture, why not let it go at that, instead of worrying whether or not it is according to the accepted forms, or delving into higher mathematics to check the balance of the areas of light and shade? In my own photographic experience, and that of my friends who operate cameras in the various studios and portrait galleries, composition is predominantly a matter of an instinctive appreciation of beauty, rather than of a conscious striving for effect. If there is anything to be striven for, it should be that natural simplicity which, in the completed print, gives one the impression that the picture was quite un-posed. In my own work, I make it a definite rule never to lay a finger on my subject during a sitting. I find that it puts the average person vastly more at ease if you merely tell him the general position you wish him to take, and then, after the inevitable firing of lights, focusing, and so forth, chat with him until he unconsciously assumes the proper expression and pose. This, naturally enough, will enable you to capture those fleeting, natural mannerisms and expressions which really characterize a person, and which are so rare in most portraits.



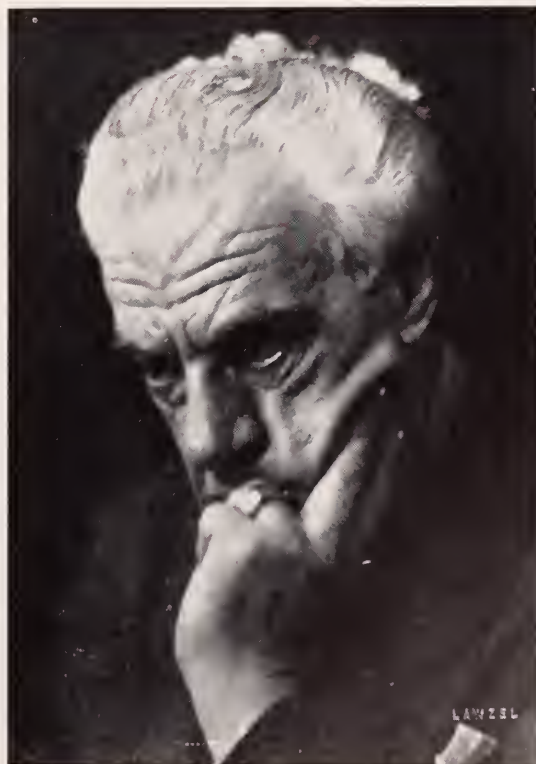
Upper left on opposite page is Mr. Grant at work in his studio. Another view of him is also shown at upper right on this page. Lower left on opposite page is portrait of Paul Nicholson. Lower left on this page is Serge Eisenstein; right is Agostino Borgato, character actor. These three portraits are examples of Mr. Grant's work.

20



But to be thoroughly satisfactory, this simple, direct naturalness must be observed in every detail of the photographic technique. If you use this method of posing your subject, your lighting should be equally simple. Obviously studied back-lightings and catch-lights would be as thoroughly out of place as a full-dress suit on the golf links. But lighting should not only be simple, it should be used sparingly. The paramount thought in the photographer's mind should be not "how much light do I need?" but "how little can I manage with"? Of

course, the temptation, when we are working by artificial light, is to be sure that we have plenty of illumination, and to use as many units as we have available, as if to show our mastery of lighting technique. This fallacy is as deeply rooted in the minds of many professional cinematographers and portraitists as it is in the minds of the amateurs; yet if you visit the sets presided over by the really great cinematographic artists, you will at once notice that they invariably use an
(Continued on Page 41)





A true son of a Cinematographer.



Gilbert Warrenton, Jr., and his mother.

A Professional Amateur Plans Unique Film

USUALLY, you hear the members of a cameraman's family complaining because the cameraman is so busy photographing other people that he neglects his own. Somewhat like the well-known cobbler whose children's shoes always need repairing.

However, no one will be able to say that about Gilbert Warrenton, A. S. C., one of Hollywood's best-known Cinematographers. As a matter of fact, Mr. Warrenton's young son, Gilbert, Jr., some day may well grow tired of being photographed so much. Either that, or he will want a camera set up in every room of his home, ready at all times.

Mr. Warrenton is like the fireman who spends his day-off in the fire station, for when his day's work is through at the studio he dashes home and relaxes by using his Filmo making personal movies. For variety, he picks up his Leica and makes unusual "stills." He declares that he really becomes quite rested by shooting several hundred feet of 16 millimeter pictures and a flock of stills after a long day at the studio.

But, getting to Gilbert, Jr. This young man was born December 27, 1930, and at this writing has been photographed more times than the ordinary individual in a lifetime. There is a reason.

Mr. Warrenton plans to make what should be one of the most unusual motion pictures ever placed upon a screen: a motion picture record of the growth and development of his young son. In other words, instead of having a book of snapshots taken from time to time, young Mr. Warrenton, when he reaches the age of fifteen years, will be able to go into the

family projection room and there upon the screen see himself grow, as it were.

The first photographs were made when Junior was thirteen hours old. Daily since then his father has photographed a certain amount of footage of the baby. For the first two months of the baby's life his father plans to make daily shots. Then he will photograph him weekly for the next year. The next year will see him photographed twice a month. Then it will be limited to once a month.

"This film," says Mr. Warrenton, "will be cut and titled, and I feel that we will have one of the most priceless possessions that a mother and father could possibly have. Can't you imagine the joy ten years from now of seeing that baby practically growing on the screen?"

"This cinematographic record of my son is not planned for any scientific reason. Merely to have as near a living picture of his growth as possible. I note that scientists are advancing the theory that a child's future may be foreshadowed by the motion picture camera. That idea, as advanced by experimenters, is to the effect that individual differences in capacity, emotional characteristics, personality traits and the like assert themselves early. There may be a lot to that, but what we are striving for and hope to have is just the most human and interesting motion picture one can have—the picture which shows the advancing steps in our child. Personally, I think it will be priceless not only to his mother and myself, but to the boy in later years when he gathers his own children about him and shows them this picture."



Mr. Warrenton photographs his son.



Making another shot.

Announcement...

In the March issue of the Cinematographer will be found a new department devoted to technical

LABORATORY PROBLEMS

This department will be conducted by

MR. EMERY HUSE, A. S. C.

Technical Editor of The American Cinematographer, and one of the recognized authorities on laboratory work. It is hoped that this department may become one of the most valuable features of this publication. If you have problems, send them in.

Filmo Topics

BELOW is the table of contents of the February issue of Filmo Topics, the very interesting monthly publication of the Bell & Howell Company. Copies may be obtained free by writing the Bell & Howell Company, at 1848 Larchmont Avenue, Chicago, Ill.:

Cover—Florida sunset boating scene, with Filmo operator.

FILMOS WHICH WORK FOR A LIVING—News photo page dealing with vocational uses of Filmo Cameras and Projectors.

"BRING OUT THE OLD ONES"—Spend an evening with your films of years ago."

FILMING ALASKAN EXPLORATIONS—By Bernard R. Hubbard. The "Glacier Priest," head of the Department of Geology, Santa Clara University, California, tells of his Eyemo movie-making experiences on the Alaska Peninsula.

WINTER MOVIE MAKING—How to make the most of current cinematic offerings in the north and south.

THE LOG OF AN ANCIENT EYEMO—By M. E. Diemer, Ph.D.

TITLING YOUR FILMS—No. 5—Using Block Letters.

LIGHT—ITS PART IN FILMO PROJECTION—Article No. 14 of the "Facts About Filmo" Series, telling how four hair-like filaments are used to produce the most brilliant of home movies.

Home Talkie Combination Invented by Chas. Capehart

A COMBINATION home set that can be used for recording of voice and sound in making of home talkies, reproduce the synchronized pictures, play phonograph records and tune in on broadcasting stations has been invented by Charles Capehart, of the Glee-Heart Record Co. It will soon be placed on the market to sell for about \$300.

Local S. M. P. E. Elects

DR. DONALD MacKENZIE of the Electrical Research Products, Inc., was elected Chairman of the Hollywood Section of the Society of Motion Picture Engineers, at the January meeting of this branch. Emery Huse, of the Eastman Kodak Company, was elected secretary, and L. E. Clark was chosen as treasurer.

In addition to the above named members, the following compose the board of governors of the local branch: Peter Mole, of Mole-Richardson, who was last year's chairman; H. C. Silent of Erpi, and George Mitchell of the Mitchell Camera Corporation.

With the Spring meeting of the Society of Motion Picture Engineers slated to be held in Hollywood, the local section has much work laid out ahead and the members are already laying plans for the most active year since the Hollywood branch was organized. Dr. MacKenzie has many excellent plans for the work of the local section and the section looks for a banner year ahead.

British S. M. P. E. Holds First Meeting

THE British Society of M. P. Engineers, formed to supersede the London branch of the American body, has held its first meeting and discussed general plans. A constitution has been drawn up and the organization plans extensions both in its activities and in scope. Relations with the American S. M. P. E. will continue to be friendly.

The provision committee, which prepared the constitution, includes S. Rowson, A. S. Newman, Paul Kimberley, Leslie Eveleigh and others.

Victor Builds Projector For 250 Watt - 20 Volt Lamp



WITH the almost universal adoption of the 16 mm. film and motion picture projectors for practically all non-theatrical uses, intense screen illumination has become a feature of vital importance in the more highly developed equipments.

The Lamp manufacturers have expended every effort toward devising a Projection Lamp of the greatest possible efficiency. The latest accomplishment in this direction is the 250 watt - 20 Volt, T-10 size lamp which was just recently placed on the market.

This low voltage lamp can, however, be satisfactorily used only in connection with a special transformer for 100-120 Volt, 50-60 Cycle, A. C. operation.

The new Model 3-G Victor Cine-Projector has a special transformer built into the base, which permits the 250 Watt - 20 Volt lamp to be used with the utmost efficiency, and with maximum lamp life.

To provide for use of the 3-G Victor Cine-Projector in communities where 50-60 Cycle Alternating Current is not available, a "change-over" system of wiring has been utilized which permits the transformer to be cut out by removing one attachment plug and changing the location of another. The projector may then be operated on any 100-130 Volt Direct or Alternating Current. The No. 10 Victor Lamp Rheostat may also be attached to permit the use of the 165 Watt - 30 Volt, high intensity lamp.

Another feature of the Model 3-G is a highly perfected optical system which utilizes as much as possible of the light emitted by the source.

Mechanically, the 3-G Victor Cine-Projector is identical to the widely known Model 3, which embodies the following features: Perpetual safeguarding against "Jumpy" Pictures—Positive Film Protection—Protective ever-dependable Double Claw Film Movement—"Framer" for accurately centering image on screen—Rack-and-Pinion Focusing—Highly developed Super Optical System—Direct Gear Drive (no belts) with Clutch Control—Extreme Quietness—Great Durability—Many Operating Conveniences such as Built-in Rewind for Automatic Rewinding of one film while another is being shown, Reverse Action for running film backward, and Stop-Action for "Still" projection.

In appearance, the 3-G differs from the Victor Model 3 only in that it has, in place of a pedestal base, a receptacle base in

which the transformer is housed. This new base adds beauty and character to the projector, making it a very attractive as well as highly efficient instrument.

Government Studies Motion Pictures As Business Aid

TO WHAT extent the American movie has "gone into business" as an aid in promoting operating efficiency, and the degree of success attending the use of such methods by industry, form the subject of a special study now being made by the Motion Picture Division of the Bureau of Foreign and Domestic Commerce.

At least 2,000 concerns in the United States, it is known, have used the motion picture for some business purpose. In other cases the ends sought are creation of good will through illustration of the firm's products or services. Safety and efficiency of plant operation are being promoted and better personnel relations secured by many firms through exhibition of educational films within the organization itself.

The Commerce Department through a questionnaire addressed to these 2,000 concerns is seeking to determine how extensively the films are being employed for these various purposes and how efficient in point of results they are found to be. With regard to the public use of business movies in particular, the Commerce Department wants to know from each firm the number of people viewing its films in the course of a year in schools, theatres, trade meetings, etc., how difficult it is to arrange for showings, and the places in which the showings are found to be most profitable.

The planning and control of motion picture campaigns for business purposes, technical problems of production and distribution, and methods of measuring the efficiency of the use of films in the different branches of business are also dealt with in the Commerce Department's questionnaire.

What the department finds out is expected to shed much light on the use and value of motion pictures in business, and help formulate plans for the most effective use of films. The experience record of past users of films in business will be of assistance, it is believed, not only in suggesting successful methods of procedure in securing best results with new productions, but also in helping to obtain a more extensive and productive use of films which may be already in use. A combined experience record in this field will also offer a standard by which the success of motion picture activities in general may be gauged.

Replies to the Commerce Department's questionnaire are already being received, and the Motion Picture Division expects to have the results of the study in form for publication within the next few months.

Advisory Committee Named

THE EXECUTIVE board of International Photographers, Local 659, has named a special committee of fifteen, of which Hal Mohr is chairman, to work out plans to secure for members of the organization every possible assistance in the alleviation of unusual conditions prevailing in the industry today and also to discuss and advise upon any other matters which may be presented to it by the board.

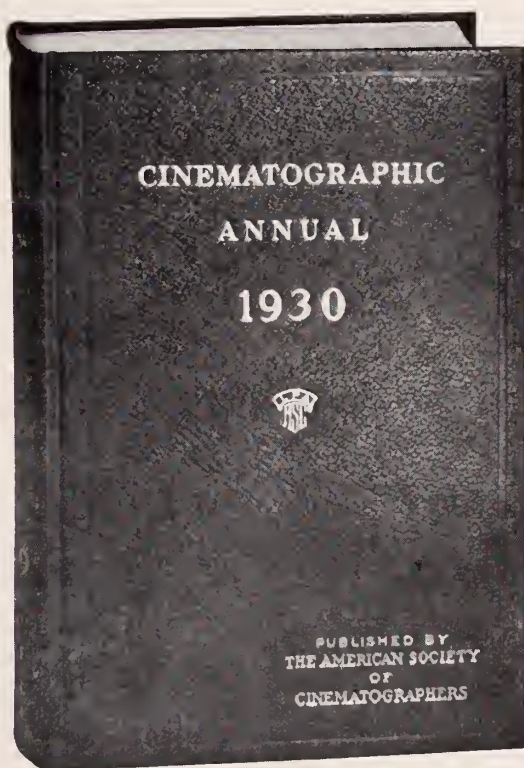
Asked by the board to make the selection the special committee has named John W. Boyle to accompany Vice-President Roy H. Klaffki and Business Representative Howard E. Hurd to the east coast for conferences with the presidents of the five International organizations represented in the studios.

Later the delegation of three will confer on pending matters with the International-Producers committee in New York.

The special committee of members is composed of the following:

John W. Boyle, Dan Clark, Arthur Edeson, Alfred Gilks, Roy Hunt, Ray June, Oliver Marsh, Arthur Miller, Victor Milner, Hal Mohr, Hal Rosson, John Seitz, Karl Struss, James Van Trees, and Gilbert Warrenton.

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Fig. 3
Lens Speed Chart

Values of light transmission (aperture area, speed) for given f values

f	% light transmission		Multiple Speed values standard scale approximately correct
	correct I	approximately correct II	
1.0	100 %	100 %	(1000)
1.5	44.44	44½	
1.8	30.86	30¾	
2.3	18.89	19	
2.7	13.71	13¾	128
3.0	11.11	11	
(3.16)	(10.00)	(10)	(100)
3.5	8.16	8	
4.0	6.25	6¼	64
4.5	4.93	5	
5.6	3.18	3 1/5	32
6.3	2.51	2½	
8.0	1.56	1½	16
9.0	1.23	1¼	
(10.0)	(1.00)	(1)	(10)
11.0	0.82	4/5	8
16.0	0.39	2/5	4
22.0	0.20	1/5	2
32.0	0.09	1/10	1

The above chart accompanies the article on Screen Definition on pages 12 and 13.

If any reader wishes reprints of these charts, write to the editor and we shall be pleased to mail them free.

An Interview with Frank Capra

(Continued from Page 20)

pictures will be better. Picture people seem to have the idea that a butler must have a voice of a certain quality. So they pick the butler by voice. I've heard a lot of butlers in my time, and I have yet to hear two of them with twin voices, if you get my meaning. But on the screen they all sound as though they were trained in the same school of elocution.

"The same with other characters. The voice, as long as the player can speak clearly enough to get across, should be forgotten. Just because a man plays the part of a gutter rat does not mean that his voice should be of a certain type. No two gutter rats sound alike. So why have them sound alike on the screen? Do you get my thought?"

We did, thoroughly. And, may we say here, that Mr. Capra touched a spot that has been a sore one with us. No wonder he has made successful pictures. He thinks intelligently.

And—just another angle to this business of picture making from this young man. It has to do with costs, and supervision.

"You ask me why Columbia has so many good pictures," said Capra in reply to said question. "Well, I think the chief reason is because they give a director such a free hand in his work. They demand quality and results. But they give you a chance to produce them. And this makes for lower cost, also. For, a director realizes he is more or less on his own as far as the picture goes. If he can give a good picture at a low cost he has scored doubly. Naturally, if he is using his head, he will see that there is no waste."

Rather a good thought there for the industry.

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Mexico

(Continued from Page 25)

down through the water and became imbedded in the earth beneath, anchoring the rafts. This process went on until now, as you can see from accompanying photographs, this has become one of the wonders of the world. Truly magnificent is it all. As twilight falls and you are floating along in one of the little boats you suddenly hear the soft tinkle of a guitar. Then the sound of a melodious voice floating through the evening air, and around a bend you see a little restaurant boat approaching. The boat pulls up alongside you and you may dine and wine to your heart's content while the entertainers softly sing and play the Spanish airs that are so delightfully appropriate in that spot. Romance is in the very air.

Step for a moment into the ruins of the convent at Acolman. From the outside apparently just ruins. You walk with a feeling of reverence to the interior and suddenly you find yourself in a chapel that for sheer, exquisite beauty takes your breath away. Paintings that were done by masters ages past and which still retain the magnificent colorings of the day they were done. An altar covered with solid gold a quarter of an inch thick, beaten there by artists of a kind and skill unknown today. Crucifixes of solid gold. And over all an atmosphere that makes one realize that there is such a thing as religion, such a thing as a God. Through the ages these priceless treasures have been there, unmolested by marauders, no matter what government was in control. A testimony to the greatest element in life—religion.

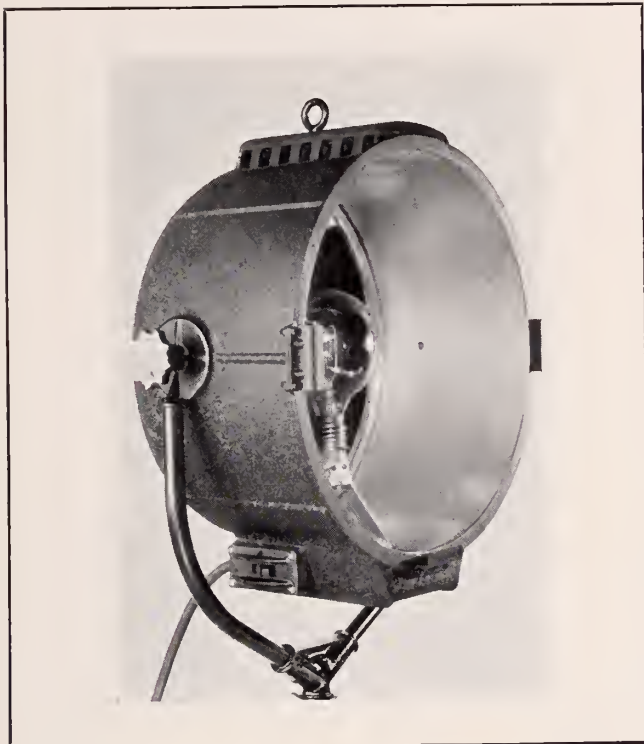
As we arrived in Mexico the great annual pilgrimage to Shrine of Guadalupe was in progress. As we drove along the country roads we saw thousands upon thousands of worshipers trudging along on foot. Some of them had walked hundreds of miles. Some were crippled, were dragging paralyzed legs behind them as they slowly and painfully made their way to the greatest of all Shrines. There was a certain something about this implicit faith that stirred you within, that made you wonder why so many people scoff at religion. And on December twelfth when the hundreds of thousands of pilgrims climbed the hill to the foot of the Shrine—well, to say it was inspiring is putting it very mildly. That is Mexico, however. Deeply religious.

Some of the customs are unusual. Take, for example, at the town of Pueblo on a Sunday afternoon. The military band took station in the bandstand in the main plaza of the town. Dreamy, Latin music mixed with stirring military marches and blood-quicken Spanish dance numbers. Everybody in the town, dressed in his or her Sunday best, was out for the afternoon entertainment. Beautiful, dark-eyed *Senoritas*, with the ever-present *Duenna*, strolled slowly up one side of the plaza. Gay, and dashing young *Dons* strolled down the other side of the plaza. Always the girls and boys apart. Here and there a guarded smile from a *Senorita* as she noticed a young man who struck her fancy. Just a smile, however, of the guarded sort. No flirtation such as we know it. Perhaps, only a suggestion of a glance, which would start the heart a beat faster in some young Mexican. Charm, romance, sweetness—you find them all in this marvelous country called Mexico.

Czechs Restrict Foreign Films

THE Association of Czechoslovak Exhibitors recently created a committee to work in connection with the distribution of imported sound films. It will be the committee's task to examine these sound films to determine whether or not they are objectionable from a political standpoint and to regulate the exhibition of foreign dialogue films in Prague. The committee has decided that the maximum number of German films to be first-run simultaneously in Prague should not exceed three or four.

"Integral Inkies"



MOLE-RICHARDSON, Inc., original designers and manufacturers of incandescent equipment for set illumination, announce a new product, the Integral Inkie. This new lamp is generally conceded by those experienced in set lighting to being the most satisfactory unit of its type ever offered for set lighting purposes.

With the recent introduction of noiseless recording, a demand has arisen for lighting equipment which is 100 per cent noiseless. The Integral Inkie meets this demand, since it has been so designed that there are no parts used in its construction which produce expansion noises when the equipment is switched on and expanding with the heat from the mazda globe.

The Mole-Richardson engineers have designed the head of the Integral Inkie of one single aluminum alloy casting. The housing, mirror dome, ventilator, light baffles, lamp trough, switch box, and trunion plates are one integral piece. This lamp head is cast from a special silicon aluminum alloy developed by the Aluminum Company of America and known in the trade as No. 43. Castings from this alloy differ from ordinary aluminum castings, in that, if they are bent or deformed they can be easily straightened, and so in case lamps of the new type are damaged by falling from the parallels or by being knocked over, they can be repaired by ordinary workmen without excessive cost.

Another feature of this alloy is that it is one of the lightest of the aluminum alloys, it being 7 per cent lighter than those customarily used.

The few additional parts to this lamp, such as the slide rods, mirror ring, etc., have been designed to have unrestricted movement which allows them to expand freely without producing any sound.

The Integral Inkie has these advantages; it is 100 per cent noiseless from the time it is switched on. It is sturdy and strong, the total weight of the complete unit being 66½ pounds. It is a convenient lamp to handle when rigging the set. Mole-Richardson already have the 18-inch and 24-inch Sun Spots of the new type of production.

Nat'l Supply Installing New Type Lighting

NATIONAL Theatre Supply Co. is installing a switchboard, said to be the only one of its kind west of Chicago, in the new Los Angeles theatre.

This switchboard, which controls the lighting of the entire house, is a new type tube-control Westinghouse electric, and is being installed at a cost of \$34,000.

All Paramount Shorts Will Be Made in East

DESPITE reports that Paramount will make some of its 1931-32 short product at the Coast it is understood that all short production work will be done in the East. One report, which has been denied, had it that James Ryan would produce shorts for Paramount at the Coast.

Columbia Set On Television

WHILE he says that no one knows "how soon television is coming or just how it is to be used," when the time comes, Columbia Broadcasting System will be ready for it, President William S. Paley told directors in his annual report. The company, he said, has been licensed by the Federal Radio Commission, and "apparatus is being loaned to us by RCA."

Stereoscopic Effect Devised By Inventor

ELWIN L. PETERSON, a Hollywood inventor, has devised a new method of making motion pictures look realistic by using the principal of the old-fashioned stereoscope, which had a picture for each eye of the observer with the two pictures merging into one and resulting in a three dimensional depth.

To obtain this effect, Peterson uses two reflectors with a single lens, and talkies, as well as stills, may be shown this way, it is claimed.

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Bell & Howell Announce Photometer For Still Cameras



THE BELL & HOWELL Still Camera Photometer, just announced, is an exposure meter which should be warmly received. It is basically the same as the B. & H. Photometer for Filmo Movie Cameras which has proved so popular, but is especially calibrated to meet the requirements of the still photographer, whether he is a beginner or a highly advanced amateur or professional.

The essential features of the original Photometer, including its convenient size, its light weight of about five ounces, and its three dials are all retained. There is the same simple procedure of looking directly through the instrument at the object to be photographed, matching an electric filament with the brilliancy of the subject, and then making an exposure reading direct from the dial system without guess work or calculation.

As in the movie Photometer, the exact exposure of any portion of a subject can be readily determined, so that the range of contrasts of any view can be arrived at with exactness.

The Bell & Howell Still Camera Photometer is calibrated to a range of shutter speeds and exposure times from 32 seconds to 1/1000 of a second, and to lens stops of from F 1 to F 32.

A tremendously important factor in still photography is that the effective photographic speeds of the different types of plates and films vary much more than the films used for motion picture work. Therefore, a dial has been calibrated in this new Photometer so that the instrument can be quickly set to compensate for whatever speed of plate or film may happen to be used. This same dial also carries another set of calibrations to facilitate quick compensation for filters of various strengths. The Photometer obviously covers all lenses, all plates or films, and all conditions of illumination that are ordinarily met with in still work.

Laco Lights at Electric Club of Southern California Meeting

AS THIS issue of the Cinematographer goes to press we receive word of an unusually interesting meeting of the Electric Club of Southern California, to be held at the Biltmore Hotel, Los Angeles, on February 2. Two subjects of interest were on the program. One was "Light and Vision" by Dr. Arthur E. Hoare, President of the Los Angeles County Association of Optometrists. The other was on "Flood Lighting" by G. M. Rankin, Lighting Supervisor of the Southern California Edison Company.

Through the cooperation of Scott Betts, Westinghouse representative, William Johnson, chief electrician at the RKO Studios, and the courtesy of Frank Arrousez and Pete Herrod of the Lakin Corporation, 69 eighteen-inch spots and one 36 inch spot with 5 KW, were to be furnished by the Lakin Corporation. These Laco lights were to be arranged to show the most modern methods of flood lighting and were to throw three colors, straw, magenta and blue light at intervals of one minute. Another feature was to be a demonstration of magnetic tube control of lights. Members of the Electric Club compose the biggest representatives of General Electric, Western Electric, Westinghouse, Grabar and Illinois Electric on the West Coast, as well as Illuminating Engineers and electric engineers of the various western plants.

Portrait Pitfalls

(Continued from Page 33)

absolute minimum of light and of lighting units. Perhaps the most outstanding exponent of this technique is that great artist, Hal Mohr, A.S.C. It has been my good fortune to play in several pictures which Mr. Mohr has photographed, and each time I have been amazed anew at his ability to coax the maximum effectiveness out of the minimum number of lighting units—I almost said, his uncanny ability of not using unnecessary lighting equipment!

This same technique can be used with even better results in portrait photography. Without using either extremely fast lenses or super-sensitized emulsions, I have found that two ordinary incandescent units are all that one needs for any purpose. And both of them are ordinary broadside units; I have never owned a spotlight, for I have yet to encounter a situation in which one is really necessary. In fact, there are many times when a single unit is sufficient. Normally, I simply place one light fairly close in on what a cinematographer would call the "hot" side, and move the other quite far out on the other side, adjusting these distances until the correct balance is reached. This is vastly simpler, naturally, than having to bother with a larger number of units, playing around with tricky catch-lights, and so on; and, which is more important, it gives a more natural effect—a picture that is "easier to look at."

Another pitfall into which the portraitist is all too apt to tumble is the matter of diffusion. Now, a mild degree of diffusion is infinitely desirable in a portrait. It gives a far more natural presentation of a person than a wiry-sharp picture would, for we do not see things with the same exaggerated sharpness that a Cooke or Tessar lens does. On the other hand, however, we do not normally see things in the fuzzy way that diffusing discs and gauzes portray them. Therefore, if we are striving after naturalness in our portraits, we cannot secure a natural diffused effect by the use of an anastigmat with discs or gauzes interposed to break up the image. The only satisfactory method is to use a true soft-focus lens—of which there are many on the market—which sees things with the same natural softness (a thing quite distinct from fuzziness or out-of-focus blur) that our eyes do. In that way we can get an image which is really in correct focus, and yet has the diffuse softness which makes our picture natural, and "easy to look at."

Amateur Movie Making

(Continued from Page 30)

Composition

The average amateur seems to forget that there is such a thing as composition. He usually just lifts his camera and shoots. Sometimes he secures a beautiful result. Most of the time he doesn't. A little care would eliminate most of this failing. Go to the theatres and watch closely the manner in which the professional cinematographer frames his every shot, especially the exteriors. Study the work of some of these master craftsmen. It will be well worth your time. You can learn more in one evening at a picture theatre than you can learn in a month from a book—if you really apply yourself.

Most amateurs neglect this matter of properly framing a picture with the result that they sometimes become discouraged when they see the work of another amateur who has studied this feature. A little time spent in looking over the subject before you shoot and you will find the most beautiful angle. At least, give this matter some thought before you go afield again with your Filmo, Victor, Cine-Kodak or what ever camera you are using. All of us cannot be artists, true. But we can at least try. And this writer believes that the real joy of making 16 millimeter pictures is the satisfaction of knowing that you have done a good job.

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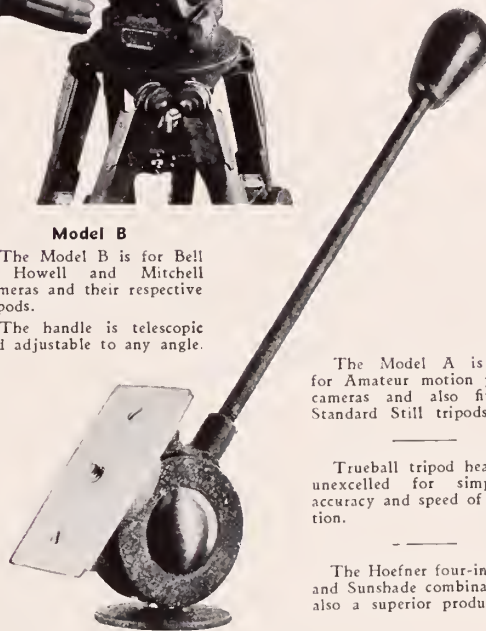


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New Carbon Saving Device From Golde Manufacturing Co.

A TIMELY development is an economical new carbon saver being offered by the Golde Manufacturing Co. of Chicago, projection engineers and manufacturers of projection room equipment.

The new carbon saver, it is said, allows the use of the 9 mm. stubs heretofore discarded. The 20-inch, 9 mm. carbon used in high intensity reflector arcs, now burned for about seven reels' running time, costs approximately five cents per reel. The waste, about 35 per cent in the form of a stub impossible to burn in that type of lamp, may with this new carbon saver be used for two more reels, making a saving of 30 per cent.

This saving, the company states, is accomplished with very little effort on the part of the projectionist.

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attention

The pictorial section of the next volume of the Cinematographic Annual is being compiled. Anyone wishing to contribute prints for this section may send them in now for consideration.



Even in South Africa



HERE we see a group of South African natives making their own photographic records. T. J. Connolly, S. A. C. Bureau, Palace of Justice of Pretoria, taught these aspiring young men the art of using the Filmo, and now they are shooting all over the place.

Hold Everything!

GEOROVESTI, RUMANIA—At the first showing of motion pictures here, nearly a thousand peasants, none of whom had ever seen a movie before, got frightened and stampeded when the screen suddenly flashed a locomotive roaring straight down the track toward the audience. Twelve persons were trampled in the rush for exits.

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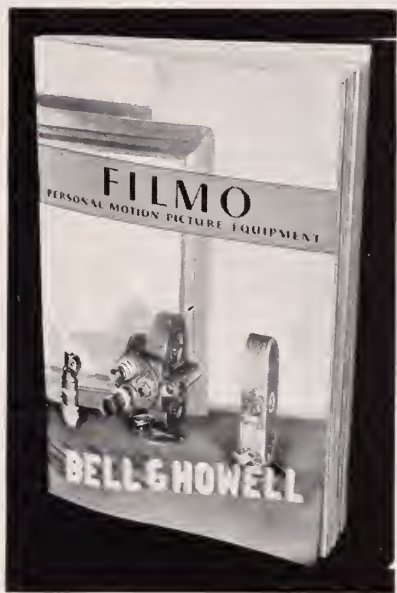
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New Filmo Catalog Valuable Textbook For Amateur Movie Makers



THE 1931 Filmo Catalog, just issued by the Bell & Howell Company, might well be termed a popular textbook on amateur movie making.

In this new book are to be found intensely interesting discussions on such subjects as why color filters are used, the principles of exposure, and when and why to use a tripod. Among other topics treated in a thoroughly popular but authoritative manner are artificial lighting for indoor movies, titling, editing, and screening. A discussion on speed lenses is particularly valuable, as is also a short but meaty section on the Filmo optical system for Kodacolor projection.

The catalog's comprehensive listing and description of amateur movie making products, including many new and unique accessories, is sure to be of definite value to anyone who owns or expects to own a 16 mm. camera or projector. The range of products listed under the Filmo banner is so extensive that the catalog will be kept for reference from the standpoint of its unparalleled completeness alone.

Among the new products included is the Filmophono, a portable 16 mm. talkie reproducer just announced by Bell & Howell. The Filmophone, we are informed, is meeting with an enthusiastic reception in the industrial, educational and home fields.

We must not fail to state that the book is unusually well illustrated. A number of full-page cuts are used to good effect. The arrangement of material is noteworthy, and makes for quick reference.

Here is a catalog which is sure to prove of unusual value to the amateur movie maker. It will be sent free on request.

One of the features in the
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will be an article on

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An Eyemo in the Arctic

TO THE MANY striking achievements of the Bell & Howell Eyemo semi-professional cameras must now be added the outstanding and almost indispensable part which one of them recently played in the filming of an arctic picture which was turned over to Paramount for release.

This picture is based upon the lives of North Atlantic fishermen engaged in the hazardous sealing industry. It was taken by an expedition under the direction of Varick Frissell, youthful producer and explorer, and it is interesting to learn that the Eyemo which served the expedition so notably, was included in the company's \$30,000 worth of movie equipment almost as an afterthought.

The work of the sealers who figure in the picture is done on the arctic ice floes drifting south each summer off the coast of Labrador. These floes consist of broken fields of ice, heaving and twisting as the great Atlantic swells and rolls underneath.

The hunters approach the seals rapidly, on the run, often leaping from ice cake to ice cake, and members of the Frissell expedition had to follow on the sealers' course as quickly as possible if they were to capture vivid and realistic pictures.

It was quickly discovered that with the ice so broken up as to challenge even the agility of the light-footed sealers, it was impossible to accomplish the necessary rapid transportation of standard camera equipment, due to its weight and bulk, but the light Eyemo, with its tripod attached, could be swung over long open leads of water and caught without impairing its ability to photograph a picture of standard production quality.

As the hunters were running towards the seals, members of the Frissell expedition would follow. When open water was encountered which defied leaping without the use of all fours, the Eyemo would be grasped by the end of the tripod, and, by a long pendulum swing could be sent flying over the water into the arms of another member of the company, and so relayed up the line into the center of action, where it was quickly put to work.

It was inevitable that sooner or later some one would miscalculate in the performance of this ritual. So it came about that one bright day the Eyemo found its way to the bottom of the ocean, but not before it had succeeded in obtaining some of the most valuable shots made by the members of the expedition. Scenes of action, we are told, in the midst of the vast seal herds, which could never have been secured with any other camera, are now a part of the Frissell picture, thanks to the Eyemo.

Too Many Pictures

"**H**OLLYWOOD makes too many pictures," Jesse Lasky, producer, told members of the Academy of Motion Picture Arts and Sciences at a recent meeting. "So many theatres have to be kept supplied with changing programs that the total income isn't large enough to stand the negative costs of the individual pictures." There aren't enough good stories in the world to supply the annual demand, he asserted, declaring that whereas a stage producer need only present one to five plays a year, the motion picture producer must meet release dates with a production a week. "Hollywood has too many 'yes' men, but not enough creative artists who can do worth-while work and meet the producer half way by realizing that the cost of any given picture has to be kept within the sum that it will draw to the box-office in competition with all other pictures," he asserted.

The directors of the Copenhagen legitimate theatres have decided upon a resolution to the effect that within the limits of their contracts artists employed on their stages will not be allowed to act in sound-films.

Tanar Equipment Gives Excellent Results for Douglas Fairbanks

LEN H. ROOS, Vice President and General Manager of the Tanar Corporation, manufacturers of portable sound-on-film recorders, of Hollywood, reports that the first film made by Douglas Fairbanks on his world tour has been received, and Roos and all who have seen and heard it are wildly enthusiastic over the results obtained by Henry Sharp, A. S. C., who is Mr. Fairbanks' cinematographer on this long trip.

The first film shot was at Hawaii, and some very beautiful results were obtained. The sound track, according to those who heard it, is admirable, and Mr. Sharp sent word that it is as simple to operate as an ordinary radio.

Incidentally, Mr. Roos reports that the Tanar plant is running full blast with seven orders for portable recorders being worked on and future business looking exceedingly excellent. Mr. Roos says that the so-called depression period has not been a depression period for his concern. His experimental department has been hard at work for some time, and within a very brief time he says his concern will have an important announcement to make regarding a separate recorder and D. C. synchronous motors. That is all he says about it at the present, but indicates that next month he will make his announcement.

Boothe Company Brochure

ONE of the most attractive brochures that has come to our attention for some time is that of the Boothe Company, Los Angeles, dealers in aluminum and aluminum alloys. The booklet, designed by the Boyd Company, advertising experts, tells the uses of aluminum and its alloys in modern industry in an attractive and interesting manner. For those who wish to know more about the possibilities of aluminum in any industry, we suggest that you write to the Boothe Company, 1400 South Alameda Street, Los Angeles, for this brochure. It will be mailed to you at once.

New Apparatus

A MUNICH firm, the Regulaphon G.m.b.H., is reported to have brought on the market a new sound-on-disc apparatus. The advantage of this new apparatus is reported to be a new correcting process by which synchronization is obtained without changing the number of rotations either of the projector or the disc support. The new set, it is claimed, has been installed in a cinema in the suburbs of Munich and is giving satisfactory results. The apparatus is low-priced, and it is expected that a public demonstration will be made in the near future.

The Sascha-Film Company, of Vienna, is reported to be planning film production on a large scale, with the co-operation of the Felner-Somlo Company, of Berlin. Another sound-film studio is being constructed in Sievering, near Vienna, which will be fitted with the newest equipment, and a Tobis recording apparatus. The annual production will comprise ten new films.

Frank Woods Resigns

THE RESIGNATION of Frank Woods, Secretary of the Academy of Motion Picture Arts and Sciences, was tendered to and accepted by the Board of Directors of the organization at its meeting of January 12.

Mr. Woods, a pioneer writer and producer, has been Secretary of the organization since its very inception, having been reelected yearly. He is leaving the office of Secretary in order to pursue writing interests that the responsibilities of his position have kept in abeyance.

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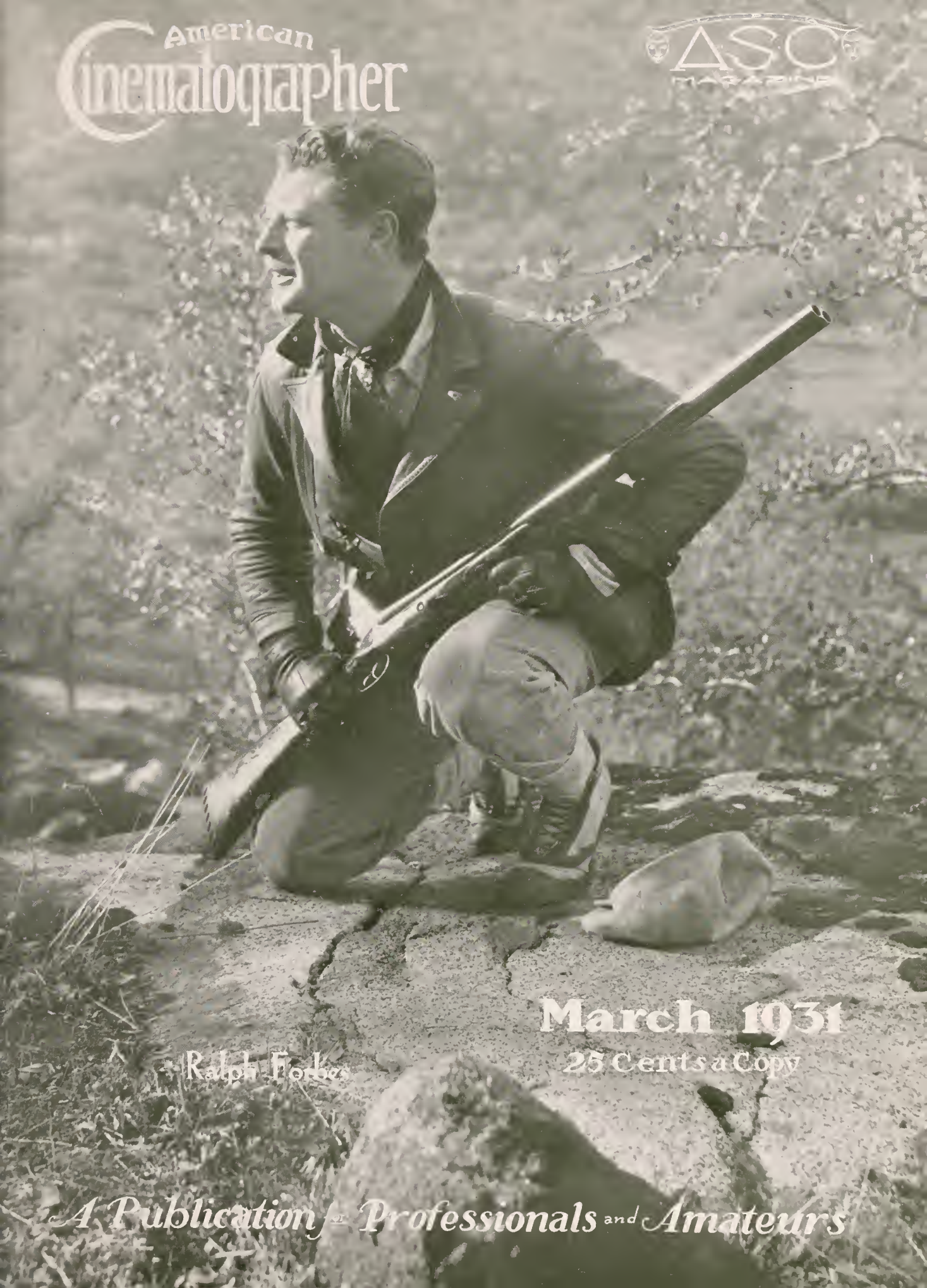


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Number 11

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Photo by Gilbert Warrenton, A. S. C.

Eastman Super Sensitive Panchromatic Type Two Motion Picture Film

by **EMERY HUSE** and **GORDON A. CHAMBERS**

West Coast Division—Motion Picture Film Department, Eastman Kodak Company

ON FEBRUARY 5, 1931, the Eastman Kodak Company announced to the motion picture trade in Hollywood, California, their new Super Sensitive Panchromatic Type Two Motion Picture Negative film. Inasmuch as this film exhibits characteristics not hitherto shown in motion picture negative emulsions, it was considered advisable to present some data pertaining to those characteristics. This article is not presented as a complete technical treatise of the characteristics of the Super Sensitive film, its aim being to call attention briefly and simply to the differences this Super Sensitive film exhibits over the present type of panchromatic films.

As the name, Super Sensitive, implies, this emulsion is extremely fast but because of its name this new film must in no way be confused with a hypersensitized film. In the past when an emulsion of extreme speed was desired, either for color photography, filter shots, or trick work, it was customary to especially treat the film with some type of sensitizing bath. This bath caused a general increase in the emulsion speed and particularly increased the red light speed. However, the hypersensitized film had certain disadvantages such as its cost, its lack of keeping qualities, and its propensity to produce fog. With the Super Sensitive Type Two these disadvantages are entirely overcome. The increased speed of the Super Sensitive film has been accomplished during the course of the emulsion manufacture. It is sufficient to say, therefore, that the Super Sensitive film is not a hypersensitized film. Furthermore, the Super Sensitive film exhibits the same keeping qualities and shows identical physical characteristics as those shown by the present panchromatic films.

A complete study of any type of film emulsion is best accomplished by making both sensitometric and practical camera tests. This article will not deal in any detail with camera tests but will consider in some detail the sensitometric characteristics of the Super Sensitive emulsion as compared with the present type of panchromatic film. The point of major importance in the consideration of the Super Sensitive film pertains to its greatly increased speed. The data obtained sensitometrically can be and have been checked by camera exposures.

Sensitometry involves a study of known values of exposure as related to the amount of silver (density) which these exposures produce upon the film after development. The standard sensitometric curve is therefore one in which is shown the relationship between exposure (expressed logarithmically) and the densities produced. It is from curves of this type that the sensitometric characteristics of the films under investigation have been studied.

Another important consideration in studying the need of the Super Sensitive film necessitates a study of the quality of the light sources to which this film is exposed. For that purpose sensitometric tests have been made to daylight and to tungsten. Inasmuch as the mode of testing an emulsion to any light source is practically identical we shall for the sake of brevity and clarity consider only the curves obtained by exposure to tungsten.

Figure 1 shows the sensitivity curve of the present and Super Sensitive type of film for tungsten exposures developed for a fixed time, nine minutes in a standard borax developer.

It will be observed that the Super Sensitive curve lies above the curve for the present type of film and the separation of these curves gives an indication of the speed difference existing between the two films. In making a numerical estimate of the speed we do not consider the actual density values produced for a given exposure. The customary method is to deduce speed from the exposure value obtained at the point where the straight line portions of these sensitivity curves, extended, intersect the exposure axis. Speed, is usually defined by the following formula:

$$\frac{1}{i} \times C = \text{Speed},$$

where i , the inertia, is the exposure value of the intersection point and C is an arbitrarily chosen constant. For the curves shown in Figure 1 we find that the speed of the Super Sensitive film, as represented by curve No. 2, is three times

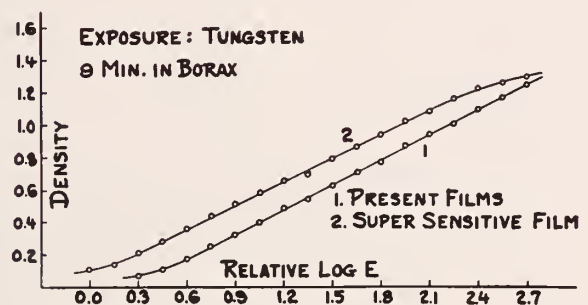


Fig. 1

that for the present type films. Identical tests made to daylight show that the Super Sensitive film is twice the speed of the present type. With reference to Figure 1 attention should be called to the marked difference in the low exposure region, that is in the toe of the H and D curve. In this region the Super Sensitive film definitely differentiates between exposures of very low intensities. Particular reference is made to the exposure region to the left of the relative log exposure value of 0.3.

The cause for the difference in relative speeds between the two types of films to tungsten and to daylight, or to any other source, is entirely dependent upon the color distribution of light from the source and its effect upon the color sensitivity of the emulsion. It is generally known that tungsten, for example, contains a greater proportion of red light than does daylight, and the difference in speed of the two films indicates that the Super Sensitive film must possess greater sensitivity to red light than the present type of film. It is mainly for this reason that the tungsten speed of the Super Sensitive when compared to the present type of film is greater than for a similar comparison to daylight.

The difference in color sensitivity of the two types of films is shown in Figure 2. This figure shows prints of spectrograms of the two types of film when exposed to tungsten. Speed comparisons should not be drawn from these prints as the

prints are so made to show the regions of the spectrum to which each emulsion is sensitive. The figures given represent wave lengths and beginning at 40 in the blue violet region we have increasing wave lengths through the blue violet, blue, green, yellow, and orange as far as the deep red given at a wave length of 68 microns. The Super Sensitive film shows an increased concentration of sensitivity in the region around 64 microns. The Super Sensitive film confines its sensitivity to the definitely visible portion of the red end of the spectrum, while the present type of films shows an extension into the deep red and encroaches upon the near infra-red region. This concentration of visible red sensitivity gives a marked advantage to the Super Sensitive as it is the extension of red sensitivity into the region of longer wave lengths which is a contributory factor in the production of chalky highlights under tungsten illumination. This is eliminated to a marked degree with the Super Sensitive film.

A complete study of an emulsion's sensitivity to color necessitates actual speed measurements to the three major portions of the visible spectrum, namely to blue, to green, and to red light. For the purpose of obtaining such information actual speed tests, similar to those shown in Figure 1 and later verified by practical exposure, were made to daylight through the No. 49 (blue), 58 (green), and 25 (red) filters. Speed values determined from such tests show that the Super Sensitive film has 75% greater speed to the blue, 200% greater for the green, and from 400 to 500% greater for the red exposures. Such sensitivity naturally lends to a better and more intelligent use of filters, either for straight photography or for trick work.

Another important consideration in the comparison of present and Super Sensitive film pertains to contrast and the rendering of shadow detail and softer highlights. Figure 3 shows for tungsten exposures the difference in time of development between the two types of film to produce equal degrees of contrast (gamma). These curves are of equal

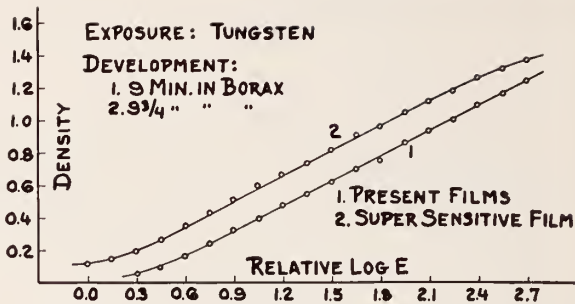


Fig. 3

gamma and the data contained shows that it was necessary to develop the Super Sensitive film three quarters of a minute longer to produce this effect. Furthermore, greater density is picked up in the low exposure region. This is mostly accounted for by the increased speed of the Super Sensitive emulsion, but it is this ability to pick up and differentiate between these low intensities which gives the high order of shadow detail rendering which is shown by this Super Sensitive emulsion. On the other hand, in the region of high exposure it will be observed that the Super Sensitive film shows a tendency to break into a shoulder, while the present film continues as a straight line. This is at least true for the series of exposures shown in the figure. This break into a shoulder lends to softer highlight rendering and still permits of very definitely separating highlight intensities and thus produce details in this region.

Figure 4 shows in much more detail the relationship existing between contrast (gamma) and time of development. These curves, made from exposures to tungsten, represent what are commonly referred to as time-gamma curves and they show the rate at which gamma builds up with increasing

(Continued on Page 21)

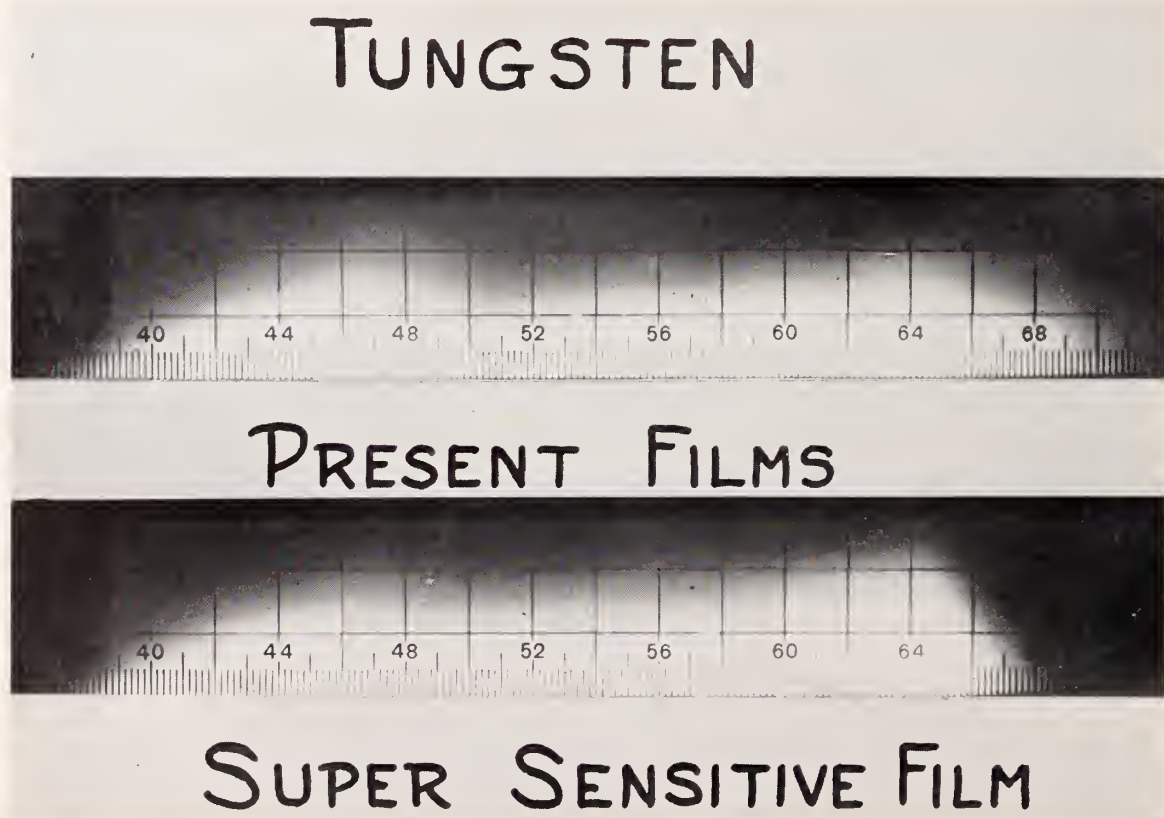


Fig. 2

Three Color Subtractive Cinematography

by P. D. BREWSTER AND PALMER MILLER

Brewster Color Film Corporation

UP TO the present only two color subtractive pictures have been shown, and while great improvements have been made in two color subtractive cinematography, these pictures only seem to stress more greatly the need for a three-color process. It is apparent that color cinematography will never be generally demanded by the public until it can portray colors with a reasonable degree of accuracy.

The problem is divided into two parts: first, the design of the camera, and second, the chemistry and the development of the mechanisms necessary to produce a three-color film adapted for use in any theatre without changes in the projection apparatus.

It is generally conceded that any practical color camera must make its color separations simultaneously to avoid intolerable flashes or fringes of color around moving objects and that all three separations must be made from the same viewpoint; otherwise, it would be impossible to register or superimpose the several component color images in the positive.

Accepting the limitations of a camera for making simultaneous separations from the same viewpoint, the next step is to inquire into the requirements of lenses with regard to focal length and speed. Under sound studio conditions where tungsten light is very largely in use, and where an excessive amount of light cannot be used on account of the incident heat and strain on the actor's eyes, it is necessary to use the fastest possible lens having good color correction. The limiting aperture at the present time is $f/2$.

The great size of some of the sets used in the studios, and the limited floor space of sound stages, make it essential that the color camera be adapted to use a wide angle lens of not over 50 mm. focus, though 40 mm. would be still better. At the same time the beam splitting system must permit the use of lenses of from 100 mm. to 150 mm. focal length for making simultaneous close-ups and semi-close-ups in connection with a 50 mm. camera shooting long shots.

This is a very difficult requirement for both the 50 mm. and 150 mm. lenses for several reasons. In a 50 mm. camera it is very difficult to get a double beam splitter (adapted to reflect two images and transmit one) in the small lengths of 33 or 35 mm. between the rear vertex of the lens and the focal plane; while in the case of the 150 mm. $f/2$ lens

the cone of light leaving the rear vertex is nearly 75 mm. in diameter, which very greatly increases the size of the beam splitter if no light is to be lost.

Where two or three matched lenses are used, it is necessary to have a beam splitter in front of these lenses to reflect the light rays received from one point into the separate lenses, and where one lens is employed the splitter must be behind to divide the light rays projected from the single lens into three groups. We believe this can be done only in two ways; either by a series of glass prisms, or by means of a highly polished mirror revolving at an angle to the lens and in the path of light rays. This mirror consists of a disk having a number of slots in it so that one portion of the light rays is transmitted through these slots or openings, and after passing through a suitable filter, is recorded as one of the separations; the portion of the light rays which strikes the polished surface of the blades is reflected through another filter to form the second separation; a second mirror revolving at right angles to the first is used for making the third separation. The mirror usually has three blades and makes at least two revolutions for each exposure so that each frame is exposed three or four times. These repeated exposures have proven to give exactly the same effect on the screen as simultaneous exposure of the different color separations.

The glass prism system has the advantage of extending, in effect, the extremely important distance between the rear vertex of the lens and the focal plane in proportion to the index of refraction of the glass used. It also has the advantage of cheapness when compared with the revolving mirrors, while the size of the driving mechanism of the camera is reduced thereby preventing noise and reducing the size of the camera.

The revolving mirror system has the advantage of not having to transmit the light through glass, which results in a loss of light, but what is more important, a possible loss of definition near the edges of the picture if the glass path is too long. Most important of all, it is possible with a revolving mirror system to make three color separations on three separate films from a 50 mm. $f/2$ lens, without adding any lenses to the standard objective to increase the light path between the rear vertex and the focal plane.

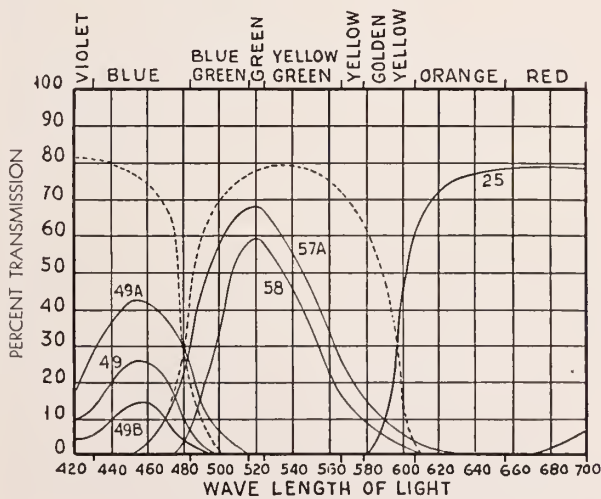


FIG. 1.

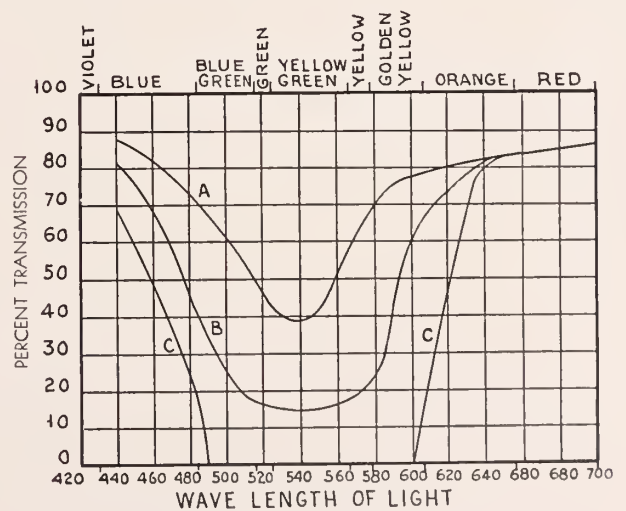


FIG. 2.

The decision as to whether to use one, two, or three films for recording the color separations depends not only on the camera design, but also on the study of the relative efficiency of panchromatic film exposed through three filters in comparison with that of two or three separate films sensitized for the region in the spectrum which they are to record.

Color separations are usually made on panchromatic emulsions by photographing through the Wratten filter No. 25 for the red, No. 57A or 58 for the green, and 49A, 49, and 49B for the blue. Transmission curves for these filters taken from the Eastman filter chart and illustrated in Fig. 1 show that No. 25 is nearly an ideal filter for the red. It transmits light of its own color, red, with high efficiency and then cuts off the other colors abruptly. None of the green filters are nearly as perfect—they transmit blue-green and green fairly well, but cut well into the orange by a long slope, with a possible average efficiency in the very important yellow green region of 30% or 40%. This critical region which largely controls the true color rendering of flesh and foliage is also harmed by the low sensitivity of panchromatic film at this point.

The blue filters 49A, 49, and 49B are even less efficient; their total over-all efficiency being only 0.7%, 0.5%, and 0.3%, respectively, and of their most favorable colors they transmit only 42%, 26%, and 15%. They cut off practically all exposure in the violet and record solely in the true blue region, while the sloping cut transmits some of the blue-green which should not be recorded by the blue separation.

The lack of efficiency of these filters is due to inherent qualities common to all dyes of these colors and cannot be improved. In fact, we have found Wratten filters to be of very high efficiency, and were it possible to have filters in the blue and green as good as the red No. 25, which hypothetical filters are represented by the dotted lines, they would be satisfactory.

By using three separate films for the color separation, it is possible to use an old type of non-color sensitive negative for the blue separation. The sensitiveness of this type of emulsion stops almost exactly at the ideal point, naturally recording the violet as well as all of the blue. Not having to use a filter, its speed is many times greater than if it were necessary to use an inefficient type of blue filter with panchromatic film. Advantage can be taken of this fact by reflecting only a small portion (possibly 10% to 15%) of the light rays received from the lens to form the blue separation.

In case of the green separation, the use of separately sensitized films is even more important, for we then are able to obtain an emulsion which records the green and yellow-green very evenly, almost to the D line, and then abruptly cuts

off. Of course this emulsion is sensitive to blue, but this blue is cut off by the use of a filter of high efficiency such as an Eastman K 2. By this means we get a much higher over-all efficiency and are able to record the yellow-green region with much greater fidelity.

The red separation can be made on a red sensitive emulsion, but the present panchromatic emulsion is excellent for this purpose. In either case it is necessary to use the No. 25 filter which cuts in exactly the correct place and which has a very high efficiency.

There is a second point in favor of separate films. It is well known that if different portions of a negative emulsion are exposed to light of different colors, they will develop to different contrasts for the same time in the developer; or these different portions of the films acted upon by lights of different colors will have different gammas. This would result in an incorrect contrast scale of the color positive, and make it difficult, if not impossible, to get a true rendering of high-lights and shades; though it would be perfectly possible to reproduce middle tones in the picture substantially correctly. The film exposed to the red light will develop the highest contrast or gamma, and the blue the lowest, for a given time in the developer. For example, if the middle tones were correct one might have red highlights and blue deep shadows.

By determining in advance the gamma curves of the separate films for light of the three primary colors, it is possible to time the development of these films so that they will produce three negatives of equal gamma, or contrast range, from which correct positive prints can be made.

In our opinion, the requirements in the positive for each of the component images of a three color film are: definition, transparency, gradation, and hue.

Definition, especially for the blue-green and magenta images, is a matter of extreme importance. In our experience, it is necessary to retain the outlines and size of the negative image grain on the screen in order to maintain proper sharpness. Anything less than this produces a soft effect which, although very desirable for certain effects, is objectionable for long shots.

Transparency throughout the entire color range is absolutely essential. Three color cinematography requires the exact blending of all colors, and frequently needs a small percentage of one primary mixed with the other two to obtain the exact shade. It is essential that each of these primaries, whether in heavy or light shades, shall be absolutely transparent and not have the heavy tones blocked up by a residual silver or mordanted image. The ideal component image would be like a color filter, pure color imbedded in the gelatin.

Finally we come to the hue and gradation of the color images. We again have the same difficulty in securing dyes

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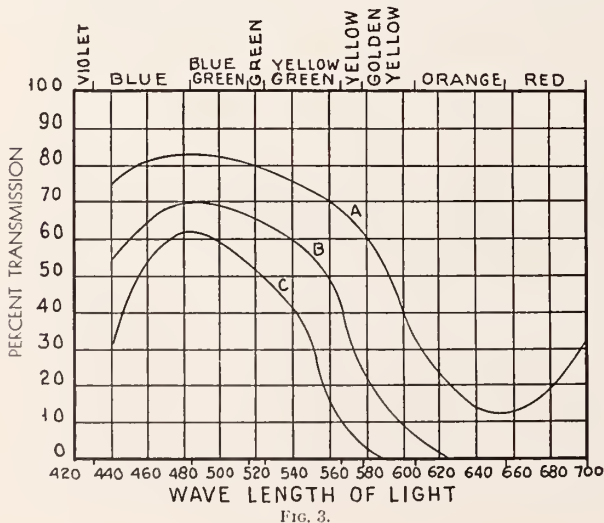


FIG. 3.

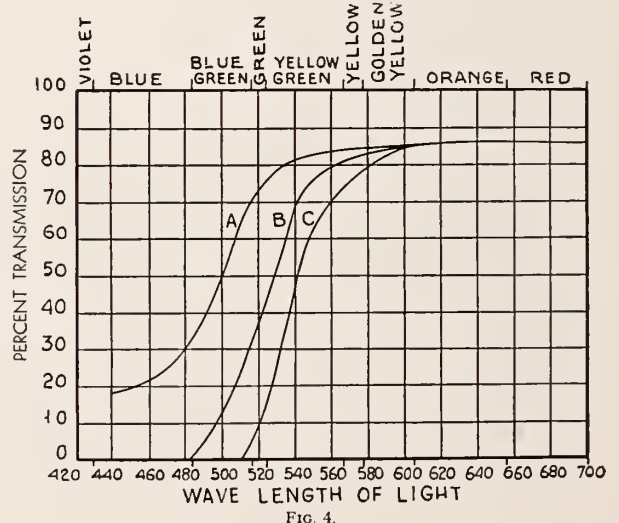


FIG. 4.

The Pedagogy of Visual Education

by **HERBERT SORENSON**

Assistant Professor in Education, University of Minnesota

I WAS asked by Mr. Hall, the editor of *The American Cinematographer*, to picture for his readers some of the instructional uses made of visual apparatus in my Minneapolis environs. No complete and exhaustive survey was wanted but a snatch here and there to illustrate effective use of pictures, slides, and film for teaching and research purposes.

To study the use of pictures and slides the writer went to the Calhoun School in Minneapolis of which Miss Ella Probst is the principal. This school, as well as many others of the excellent schools in Minneapolis, makes extensive use of visual presentation by means of lanterns and slides. Miss Probst and her teachers have ingeniously integrated visual presentation into their scheme of education.

Although this article is being read primarily by those who are not educators, I shall nevertheless describe in educational terms the visual presentations as I saw them. I am not competent to discuss the technical phases of visual education.

The significant thing that I wish to point out is not the nature of the apparatus. Whether it is or is not the latest issue from the manufacturer is not my concern. I wish to point out that visual instruction through projection can be fitted into school room procedures and satisfy the most advanced educational philosophy. Psychologically visual education has proved itself to be effective. Freeman and Wood, two eminent American psychologists, showed that children whose study was supplemented by visual instruction obtained more information than those who were denied such instruction.

Miss Probst took the writer to visit her class rooms in which instruction was supplemented by the use of lantern slides. A description of some things seen will lay a basis for showing that visual education does not lead to a mechanization of the teacher, but that it leads to the decided opposite. In a 6A grade a mechanical drawing of a marionette stage was projected on the blackboard. Two views were shown. The depicted stage was actually being built in the school for actual use. A boy had drawn two views of it on ground glass plates and the problem of the class was to construct a curtain for the stage. The projected architectural view on the board was a most valuable propaedeutic to working out their problems which were real to them. They calculated costs of the curtain, estimated its length, measured it, and engaged in all the arithmetical processes. The lantern facilitated the whole process by providing a big working drawing which everyone could see.

In a 6A room by means of a slide, several sentences were placed on the board. The following two sentences are typical of the half dozen or so on the slide.

Is not the sea filled with terrible monsters people asked him.
No, that is only a foolish idea he replied.

These and other sentences were projected on the board and the pupils' problem was to punctuate them correctly. A pupil went to the board when called upon and put in the correct punctuation marks or rather those which he thought were correct. There were forty or more pair of eyes watching for errors. Think of the economy. One projection gives every child a "copy." The board is erased except for the few punctuation marks by simply withdrawing the slide, and then all this can be "written" on the board again by re-inserting the slide in the lantern.

The marvel of this method was displayed in the lower grades. In a little class of first graders with less than a month's attendance one saw reading ability in children of such quality that

all their parents would be prompted to believe in hereditary transmission of school abilities. These youngsters had visited the school garden and then upon their return to their class room had reported their experiences. The pupils and teacher compounded these little reports into a story which the teacher transferred to a slide. This was one of the stories:

We went to the garden.

We saw some parsley.

The parsley was green.

The rabbit eats parsley.

The children pointed out words which they knew. They read their own story which had emerged from their own experiences, and again a single lantern projection furnished a "COPY" for each of forty children.

The use of lantern slides gives opportunity for children's art abilities to express themselves. In a 6B room we heard a child tell the story of Hans Brinker and the Silver Skates and we saw colored illustrations of the story while the boy told it. About a dozen colored slides were shown. These were painted by the children. They were not copied but represented scenes which the children imagined from the story. The class illustrated Eskimo life with slides which they had drawn and colored with colored pencil.

The descriptions given, although rather fragmentary, may help to illustrate real educational uses of the projection lantern for teaching. Teaching by means of slides and films is not limited to only a few subjects but can include every subject of the curriculum.

Educationally these procedures are not only sound but commendable. When children prepare their own diagrams of a marionette stage which they are building to use, when children are painting illustrations from their imaginations, and when little tots in the first grade are putting into stories their own experiences, we have what is termed a real purposeful activity or a project. To the child these experiences are real, they emerge from a natural setting. They may exercise initiative, and trade-mark their little creations with their own hallmarks of creativeness. They work together, learn cooperativeness, weigh, evaluate and pass judgments. A major vehicle in these educational activities is projection by means of slide and lantern.

A discussion of how slides are made is probably in order at this time. When a highly colored slide is wanted such as was used in illustrating Hans Brinker and the Silver Skates, plain glass is used. This glass is painted with highly colored paints but such painting is done only by those in the 5th and 6th grades and not the lower grades. When the lower grades wish a colored illustration such as used in the Eskimo study reported, they draw on ground glass with colored pencils. Diagrams and figures like those referred to in the arithmetic class are drawn on ground glass also. Class and group written work can also be recorded on these slides. Both the plain and ground glass slides can be washed and used over and over again.

For projecting word, phrase or sentence material, it is first typewritten on celophane, a celluloid like paper, which is placed in a fold of red carbon paper when typed. The celophane paper is then sealed between two plates of plain glass by pasting a special edging over their edges. Then a permanent instructional slide has been made. These can be filed and really constitute a library of instructional materials.

(Continued on Page 22)

Fig. 1
F TABLE FOR STANDARD FILTERS AS USED WITH EASTMAN PANCHROMATIC No. 2 AND EASTMAN SUPERSENSITIVE PANCHROMATIC
 (Approximately correct)

Without Filter			f values with Filter (daylight filter factors and 170° Shutter opening)																		
f	No. 2		Acro No. 1		K 1		K 2		K 3		G		A		B		C		F		
	%	f	S	No. 2	No. 2	S	No. 2	S	No. 2	S	No. 2	S	No. 2	S	No. 2	S	No. 2	S	No. 2	S	
1	100.00	1.733.33	2.46		2.46	1.7	1.44		1.44												
1.5	44.44	2.614.81	1.24	1.24	2.94	2.6	2.12		2.12			1.3				1.2		1.44			
1.8	30.86	2.910.28	1.46	1.46	4.4	2.9	2.51		2.51			1.56				1.46		1.72			1.08
2.3	18.89	4.0	6.29	1.88	5.8	4.0	3.14		3.14			2.1				1.88		2.24			1.34
2.7	13.71	4.8	4.57	2.22	6.2	4.8	4.2		4.2			2.32				2.22		2.58			1.64
3.0	11.11	5.2	3.70	2.48	7.2	5.2	4.4		4.4			2.62				2.44		2.84			1.8
3.5	8.16	5.9	2.72	2.75	9.4	5.	5.0		5.0			3.00				2.82		3.10			2.1
4.0	6.25	6.8	2.08	3.22	9.8	6.8	5.6		5.6			3.24				3.24		4.0			2.5
4.5	4.93	7.8	1.64	4.00	11.0	7.8	6.3		6.3			4.0				3.64		4.4			2.75
5.6	3.18	9.6	1.06	4.30	14.0	9.6	7.8		7.8			4.8				4.8		5.4			3.34
6.3	2.51	11.0	0.83	5.40	16.0	11.0	8.8		8.8			5.4				5.4		5.9			4.0
8.0	1.56	14.0	0.52	6.4	20.0	14.0	11.4		11.4			5.8				6.3		7.8			4.9
9.0	1.23	16.0	0.41	7.4	22.0	16.0	13.0		13.0			7.8				7.4		8.6			5.6
11.0	0.82	18.0	0.27	9.00	28.0	18.0	16.0		16.0			10.0				9.2		10.6			6.8
16.0	0.39	28.0	0.13	13.00	32.0	28.0	22.0		22.0			14.0				13.0		15.5			9.6
22.0	0.20	32.0	0.06	18.40	Sh	32.0	32.0		32.0			20.0				18.6		22.0			14.0
32.0	0.08	Sh	0.03	25.00	Sh	19.00	Sh		15.0			28.0				27.0		32.0			20.0

Key: No. 2 = Eastman Panchromatic No. 2
 S = Eastman Supersensitive Panchromatic

% = Light transmission in % for given f value
 Sh = Reduction of Shutter opening + f 32

L. M. DIETERICH

Screen Definition

by **DR. L. M. DIETERICH**

Consulting Engineer

Part 5

IN VIEW of the commercial introduction of a new highspeed motion picture negative emulsion by Eastman Kodak Co., the author offers in Fig. 1 a chart to the cameramen for quick determination of lens stop values for this new film.

This chart also includes stop values for some of the most frequently used color filters for the regular Dupont panchromatic emulsions and for the Eastman "superpan."

The f values offered in this chart are for practical purposes correct with a total overall speed increase of 3:1 for daylight, successfully tested by the author for black and white pictures as shown in Figs. 2 to 5.

The cameraman has, however, to realize that the speed increase is highest for the red end of the spectrum and especially when used in color photography and filter work this fact has to be well considered.

The speed increase has been stated to be for daylight 75% for blue, 200% for green and 400% for red.

Figs. 6 to 12 show comparative spectrograms, all taken under identical conditions with an incandescent recording lamp and daylight filter (about 5200°K).

Fig. 6 Eastman Ortho.

Fig. 7 Eastman Panchromatic Type 2.

Fig. 8 Eastman Supersensitive Panchromatic.

Fig. 9 Dupont Ortho.

Fig. 10 Dupont Red Ortho.

Fig. 11 Dupont Regular Panchromatic

Fig. 12 Dupont Superspeed Panchromatic.

It has been stated that the Dupont superspeed panchromatic increases the speed 100 per cent over the regular without changing the color balance, but broadening the width of the actinic spectrum, especially towards the red end, which is, the author believes, of a great deal of practical interest.

The reader can draw his own conclusions from the observations and interpretation of these impartially produced spectrograms, especially as far as range of spectrum, color values and their relative speed are concerned.

The proper use of any filter is largely a question of experience, as unfortunately the scientific engineers have so far not been able to develop a practical and permanently reliable exposure meter, especially where specific color values are concerned.

The multiplication factors for various filters are only an approximate guide and subject to sometimes radical changes when either stop values or shutter openings are selected. The color values of the object, the character of the illumination or light source, the actinic spectrum reaction of the emulsion, the desired emphasis of certain colors, special effects radically different from correct reproduction of inherent object characteristics—all these various conditions influence the selection and proper use of filters and the determination of correct exposure by stops and shutter opening control.

Figs. 2 and 3 show as an example the use of a K3 filter on Eastman superpan using a 50mm. Detrar lens. The purpose of this selection was to reduce the haze and corresponding overexposure for the more or less distant details of this landscape.

Deep atmosphere (blue sky) especially when moisture- or dust-laden (haze) acts like a more or less efficient blue filter with dispersive characteristics under haze conditions, thereby destroying the desired definition.

The use of a filter absorbing such undesirable rays, usually of yellow characteristics and of densities depending upon haze and light conditions greatly improves definition.

Fig. 2 shows a photograph of a landscape with distant haze.

Fig. 3. The same camera angle using a K3 filter and a stop increase from f 14 to f 9.

This was determined upon as follows: Under the existing light conditions (bright sunlight at about 1 p. m.) a stop of f 8 would have been in order with a standard panchromatic film. Using Eastman Superpan f 14 was selected as correct.

This stop value had to be increased to f 9 when using filter K3 with the results shown in Fig. 3.

Fig. 4 shows another view taken with a 50mm. Detrar lens and Eastman Superpan. A stop value of f 11 was used.

To produce a desired moonlight effect a Moore filter No. 2 (combination of Wratten filters No. 64 and 23) was selected with a corresponding stop increase to f 4.8.

Where higher light and more glaring surface reflections exist (sunlit snow scene) Moore filters No. 4 (No. E22 and B58) or the less dense No. 6 (No. E22 and B57, A3) are very effective.

(Continued on Page 35)

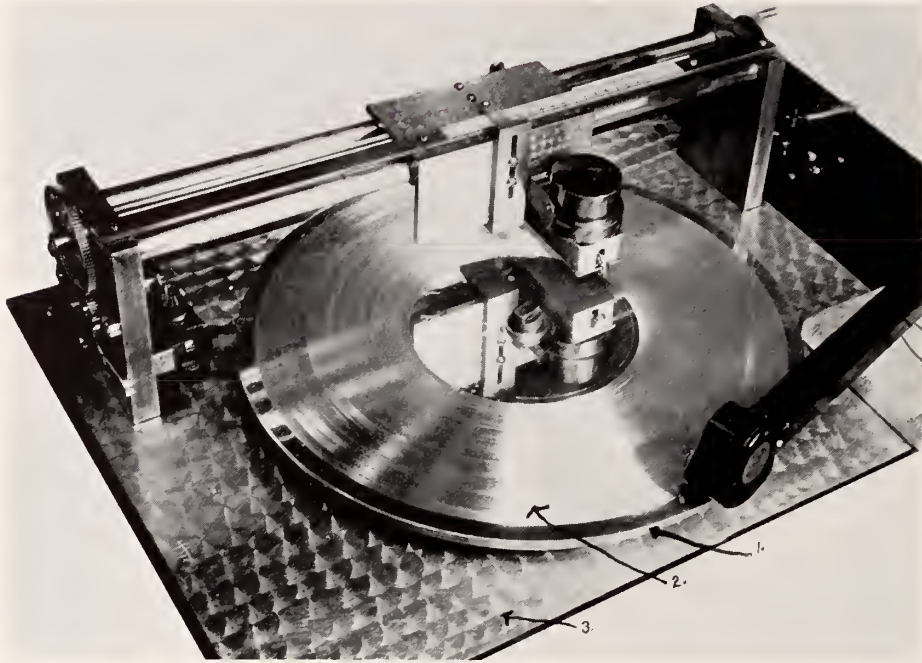


Fig. 2



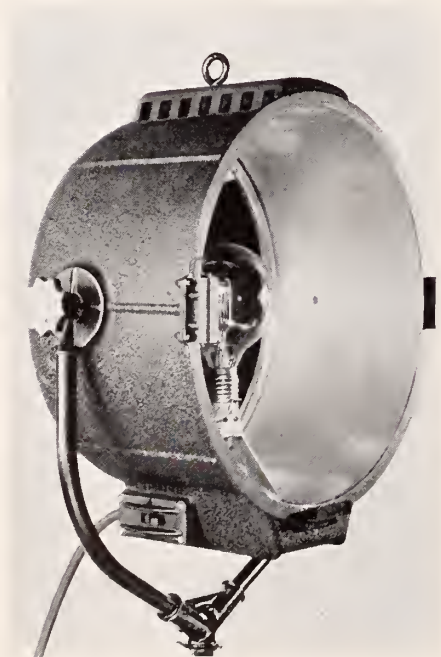
Fig. 3

First Award



Aluminum Disc Recorder for talking movies and electrical transcription. Entered by G. Russell Carrier, Inc., Akron, Ohio

Second Award



The Integral Inkie made by Mole-Richardson, Inc.

Third Award



Microphone entered by Arthur Reeves of Hollywood Camera Exchange

Akron Firm Wins Boothe Contest

Mole-Richardson, Inc., and Arthur Reeves Win Second and Third Awards

FIRST PRIZE of \$100.00 in the Boothe Company Aluminum Contest, conducted through this magazine by the Boothe Company of Los Angeles, was awarded to the firm of G. Russell Carrier, Inc., Akron, Ohio.

Second prize of \$60.00 was awarded to the firm of Mole-Richardson, Inc., lighting equipment manufacturers, of Hollywood.

Third prize of \$40.00 was awarded to Arthur Reeves of the Hollywood Camera Exchange, Hollywood.

Mr. I. J. Boothe, head of the Boothe organization, sent the following letter to the editor of this magazine:

American Cinematographer,
1219 Guaranty Bldg.,
Hollywood, California.

Attention: Mr. Hal Hall, Editor.
Gentlemen:

It is with a great deal of pleasure that we hand you the checks for the winners of first, second and third places, \$100.00, \$60.00 and \$40.00 respectively, in the Boothe Company Aluminum Contest.

This contest was originated with the idea in mind of stimulating the interest in aluminum and aluminum alloys, in the motion picture field, where we felt that the lightness and strength, (equal to that of steel) of these metals would prove advantageous to the industry, especially for portable equipment.

We take this opportunity to congratulate the winners of the prizes and also to thank the judges for their efforts and time spent in examining the entries and awarding the prizes.

We also wish to express our appreciation to the American Cinematographer for the cooperation which we have had throughout the contest.

Very truly yours

BOOTHE COMPANY

I. J. Boothe

The first prize was given for an aluminum disc recorder for talking pictures and electrical transcription. Specifications follow. It is for making professional thirty-three and one-third recording, and also for amateur and home seventy-eight R. P. M., using aluminum disc eight to seventeen inches in diameter, twelve gauge. The recorder has an aluminum base eighteen by twenty inches and one-quarter inch thick. The revolving table is of cast aluminum five-eighths of an inch thick, and is driven by one hundred and ten volts synchronous motor, with cutting arrangements and traveling horizontal across the face of the aluminum disc. The picture on the opposite page gives a fair idea of the device. Arrow 1 points to revolving table, 2 to aluminum disc, and 3 to the aluminum base.

The second award was given to Mole-Richardson, Inc., for their new lamp, the "Integral Inkie," the particular lamp entered being M-R Type 218—18 inch Sun Spot, pictured on opposite page.

From the specifications with entry we give you the data as proposed by this firm:

"This lamp has been designed to overcome a difficulty which has heretofore been present in all lamps of this general type, i. e. the production of slight cracking and popping noises. Such noises we know are due to the expansion of the various parts of the lamp when heated by the incandescent light source.

"The inherent fault with all previous designs has been the multiplicity of parts having various expansion relations to one another. We have gone to the heart of the problem and pro-

duced a lamp which consists essentially of one integral casting. The drum, mirror dome, ventilator, light baffles, lamp trough, and switch box, all of which have heretofore been cast of separate parts, are in this new lamp produced in one single aluminum or aluminum alloy casting. The few parts such as mirror ring, slide rods, etc., are so designed that they are free to expand without restriction, and hence will be incapable of producing any sounds due to expansion.

"The only parts of this lamp head which are not made of aluminum or aluminum alloy are the eye bolt and nut, the attaching screws, the mirror supporting springs, the focusing screw and handle, the slide rods, and their locking nuts, the offside trunion bearing, studs, and electrical conducting parts.

"The pedestal is constructed of duralumin tubing and castings of No. 43 alloy, with the exception of the clamp collar which is brass.

Total weight of complete lamp	62 lbs.
Weight of mirror, cable, stage plug, screws, electrical connections, socket, and casters	15¼ lbs.
(These are parts purchased outside by us and are not obtainable in aluminum alloys.)	
Less	15¼ lbs.
Total weight of fabricated parts	46¾ lbs.
Weight of fabricated parts not composed of aluminum alloys	6 lbs.
Total weight of aluminum alloy parts	40¾ lbs.
Percent of fabricated parts that are of aluminum alloys	87%

Third prize was awarded to Mr. Reeves for the Audio-Camex type microphone. The description is given as prepared by Mr. Reeves in submitting his entry:

The transmitter diaphragm which is less than one thousandth of an inch thick is made of duraluminum.

The duraluminum diaphragm is so sensitive that it records the sound vibrations perfectly at a distance that enables the cameraman to photograph a scene without getting the microphone into the picture.

The Audio-Camex bullet type microphone is constructed of about ninety per cent aluminum and duraluminum. The only parts of the microphone that are not aluminum are the parts where electrical characteristics demand a different metal.

The Ameritan transformers have aluminum covers. The aluminum shields between the amplification stages and the tubes add to the rigidity of the frame work. The swivel joint of the transmitter cup is machined of duraluminum. The covering is made of aluminum tubing. The Cannon connectors which we adapt to the microphone is made one half aluminum.

The judges of this contest, which was started last October, were Mr. Hal Mohr, President of the American Society of Cinematographers; Mr. John Arnold, Treasurer of the American Society of Cinematographers, and head of the Camera Department of Metro-Goldwyn-Mayer Studios; and Mr. William Johnson, head of the Electrical Department of the R-K-O Studios.

The Boothe Aluminum Contest aroused interest in all parts of the United States, and has proven again that Aluminum is rapidly becoming more and more a real factor in the motion picture industry. We cannot outline here the various devices suggested through this contest, but they were varied and many. Due to the lightness and strength of the aluminum alloys, this metal is rapidly creeping in to replace the heavy and cumbersome metals that have been used in the past.

Hal Hall

SAYS



Credit

FOR the first time in many a moon the picture critics on the daily papers took occasion, on the opening of "East Lynne," to give special mention to the man who photographed the picture. It was really gratifying to this writer who has always fought to bring the cameramen into the limelight where they belong. Mr. John F. Seitz did a mighty commendable piece of cinematographic work in that picture, and he deserved mention by the critics who reviewed it in Los Angeles.

Why isn't this done more frequently? That is a question this writer has been asking for years. I do not mean to detract from the work of the director, author or actor—or even the supervisor. But I do think that the cinematographer should receive his share of attention, whether it be a knock for poor cinematography or a boost for good work. Not all pictures are well photographed, we grant. But—and we ask you to give this a lot of thought—there is a darned sight more good cinematography than there is good direction, story-writing or acting in the general run of Hollywood pictures. If you do not believe me, just go and look at some picture that has proven itself a dub as far as direction, acting or story is concerned. You will see that usually the redeeming feature of the picture is good photography. In fact, there have been, and undoubtedly will be again, many pictures that have been saved by the outstanding photography of a man whose name never is seen in the papers.

Many a star would never twinkle if it were not for the genius of a cameraman who knows how to light and photograph her so her blemishes and bad points do not show. Many a director would have long ago been banished to oblivion if it had not been for the man who photographed his pictures. Many a picture would lose a large part of its value if the cameraman did not portray its mood or atmosphere. So, why not give him a little credit if he does a good piece of work! Or, give him a hard rap if he falls down. We all like appreciation, and we all like criticism if we deserve it.

Congratulations

THE EASTMAN KODAK COMPANY and the firm of Jules E. Brulatour are to be congratulated upon the excellent manner in which they introduced their new super-speed film to Hollywood. Rarely does one see a job handled so well as was that. An excellent dinner at the Uplifters Ranch, an atmosphere of rather mysterious expectancy—and then—with no attempt at sales talk, the film was introduced. Mr. Edward O. Blackburn, of the Brulatour organization; Mr. Ted Curtis of the Eastman Kodak Company; Mr. Emery Huse of the Kodak Company; Mr. George Gibson of the Brulatour organization, and many others who helped in the plans deserve praise.

Stork Arrives

THE WELL known Stork has been quite busy about Hollywood of late. During the past month he brought a daughter to Mr. and Mrs. John F. Seitz, and a daughter to Mr. and Mrs. Edward O. Blackburn. Friends of both couples will be pleased to know the mothers and the daughters are doing well.

Opportunity

JUDGING from my mail, Hollywood must seem like the pot of gold at the end of the rainbow to a lot of people scattered throughout these United States. An average of five or six letters a week come to me from readers asking me to advise them as to how they may best break into the picture industry in Hollywood. Some want to become sound engineers, some cinematographers, others assistant directors, and many wish to become actors. We take this opportunity of answering all who have written, and all who may write in the future.

If you have a good job where you are, stay there! Hollywood has proven to be a pot of suffering and disappointment to thousands who have given up good, steady jobs at home for the glamour of the studios. You will find many ice wagon and milk wagon drivers here who arrived in Hollywood fired with ambition to become one of the motion picture people with a mansion in Beverly Hills. This town has the most beautiful laundry workers and waitresses of any town I have ever seen. A poll of both classes would reveal many a home town beauty prize winner who had come to break into pictures, only to go broke and to the job of slinging hash or ironing clothes.

A novice cannot hope to compete with cameramen of years experience. It takes more than ambition to crash the studio gates when there is more experienced talent at hand than the studios can use. Just because you know how to take your radio apart does not guarantee your being hired as a sound engineer. Unless you have a bankroll that will keep you for several years; and unless you have ability and the intestinal fortitude to stick it out month after month and still keep smiling—stay on your job at home.

If you want more information, read the statement from the Academy of Motion Picture Arts and Sciences on page 42.

The Passing Show

WITH the advent of talking pictures Hollywood lost a type of individual that, to this writer, added much in the way of atmosphere to this picture town. We speak of the Poverty Row type of producer. True, the atmosphere he added sometimes reminded one of the lowly polecat. However, like the above-named animal, he made his presence felt, and was part of the big show of Hollywood. You know the type. They made more pictures, conversationally, at the corner of Sunset Boulevard and Gower street, than they did in the studio. But they were colorful. Now and then one of them would surprise the picture world with a production that would really have excellent merit. And then he would start up the stairs. Many a successful man here now started on Poverty Row. It seems too bad that the high cost of sound should have wiped that type out. To be an independent now, one must have a lot of money, for sound costs just that. Maybe the day will come when sound will cost less. And then perhaps we will see the old, colorful type spring up again. It will be a blessing for a lot of embryonic directors.

THE AMERICAN SOCIETY OF CINEMATOGRAFHERS

"PARTNER - SOME OF THE FINEST MEN OF ALL TIMES, FOR YEARS
HAVE BEEN HEWING AWAY AT THOSE BIG WORDS, MEN WHO HAVE
BURNED THE MIDNIGHT OIL AND HAVE SEARCHED VOLUMES FROM COVER
TO COVER THAT WE MAY HAVE A BETTER UNDERSTANDING OF ONE
OF THE WORLD'S GREATEST PROFESSIONS- FOR IT IS ONLY BY PATIENT
INDUSTRY THAT WE ARE ABLE TO PROVIDE FOR EACH OTHER -SO IT IS TO
THESE PATIENT AND TIRELESS WORKERS THAT I DEDICATE
THIS CARTOON"

GLENN R. KERSHNER

Magnacolor Film Announced

Consolidated Film Industries, Inc., Ready for Quantity Production

CONSOLIDATED Film Industries, Inc., New York and Hollywood, have just announced a new natural color film which has been perfected by them after long experiment. The new film is called Magnacolor, and is based on the bi-pack film process.

The bi-pack process makes use of two negatives running emulsion to emulsion. The front negative (nearest the lens) consists of film carrying emulsion sensitive to blue rays. A coating of special red dye is placed on top of the gelatine emulsion of this film. The back film consists of a highly panchromatic negative, mainly sensitive to red rays. When the two films are at the aperture, emulsion to emulsion, the light passes through the back of the first negative (blue sensitive). This gives the blue image. The light then strikes the coating of red dye, which absorbs the blue rays and allows the red rays to pass through to the second negative, thus giving an image of the red portions of the subject.

Officials of the Consolidated Film Industries claim that with Magnacolor you get a sharpness equal to black and white, and that the colors are natural and pleasing and can be held absolutely uniform in quantity production. They also claim that anything in monochrome is equally possible with Magnacolor, with no change other than the use of Magnacolor films and a slight adjustment of the camera gate.

In the announcement from Consolidated, officials say: "Not only can any qualified cameraman make this film, but he can use any technique known in black and white photography such as light effects, double exposure, changing of lights during scenes, and trick effects. Camera manufacturers have arranged for the adaptation of black and white cameras to color at small expense, making the cameras available for both color and black and white work.

"The Magnacolor process," continues the announcement, "is founded on an extremely comprehensive set of patents for which Consolidated Film Industries has an exclusive license. These patents include methods of assuring exact registration in printing, the application of the colors in processing the positive film with many modifications of methods for this, basic patents relating to the use of positive film for color work, and numerous auxiliary patents for the production of the process. In addition to these patents which so amply protect the user of color film, Consolidated Film Industries, Inc. are the owners of many patents covering developing and printing machinery and other apparatus widely used in film processing.

"The greatest difficulty in color production has always been the lack of photographic and mechanical knowledge as applied in the processing of black and white negatives and prints which are the very foundation of successful color processing. Because it has such knowledge, the Consolidated was able in a very short time to perfect the bi-pack method to a state where commercial release prints can be done with the same precision as black and white release printing in the most economical manner possible.

"It is obvious that in using two negatives, each of which contains a partial record of the colors photographed, that there must be a correct balance establishing the latent color values of these negatives when they are developed, and later when they are printed and colored on positive stock. The final results are doomed to failure unless the laboratory doing the processing has had knowledge of all its major and minor difficulties including the balancing of negatives and positives. It is this knowledge of the balance of values in black and white film, backed by years of experience and organized training for

such work which has made it possible for Consolidated to produce the splendid new color film and makes the company feel secure that the leader in the field will be Magnacolor.

"Not only is this technical knowledge of film processing essential to successful color production, but it is just as necessary that the producers of color film have a complete mastery of laboratory machinery. Consolidated has the advantage of fifteen years' experience in this field. These fifteen years represent an accumulation of technical knowledge gathered by the welding together of the most representative laboratories in the country into one large, single organization. Such a combination of units into one organization has resulted in a vast body of technical knowledge executed and administered by experts. All of these factors combined to give Magnacolor its outstanding superiority.

"Consolidated is prepared to offer cooperative service to any cameraman or producing organization which desires to learn more about the technique of color photography and to apply it in their pictures. Consolidated believes that there is a great future for color films not only in theatrical motion pictures but also in industrial and educational pictures—two fields, the possibilities of which have not yet been developed.

"In addition to the regular laboratory service on Magnacolor, Consolidated will have a staff of trained cameramen with full equipment ready to do photographic work for such clients who have no equipment of their own. In the case of industrial picture producers, Consolidated is prepared to offer its service and advice in the writing of scenarios to give the work dramatic flavor, as well as on technical subjects. Consolidated Film Industries have equipped an up-to-the-minute plant at 959 Seward Street in Hollywood for the exclusive production of Magnacolor. This new plant is ready to give complete service and prompt delivery. The company will also use its New York laboratories in connection with the Color Department, particularly for industrial color pictures."

Three Color Subtractive Cinematography

(Continued from Page 12)

that approximate the ideal as noted in the case of the filters.

The ideal requirements of the three color dyes are that each should transmit as nearly as possible 100% of the light of two of the three primary colors and in its heavier densities absorb entirely light of the other primary color.

In Fig. 2 Curve C shows the transmission of a heavy step in the magenta "H & D" strip and curves A and B the lighter steps. This dye passes nearly all the blue and red but no green. Figs. 3 and 4 show the blue-green and yellow curves for the same densities.

In order to obtain a good black it is necessary that each of the three colors absorb practically all light of one of the other primaries, and it is equally important that each in their lighter gradations pass practically equal quantities of the corresponding primary in order to obtain good greys, as is seen by the opening of the filter in the lighter steps. With the three dyes shown equal densities of the three super-imposed yield a grey.

The above paper was presented at the Fall meeting of the S. M. P. E., and is printed through the courtesy of the S. M. P. E. Journal.

—The Editor.

Eastman Super Sensitive Panchromatic

(Continued from Page 10)

time of development. The rate of increase of contrast with increased development time is appreciably less for the Super Sensitive film, as will be shown by a study of the curves in Figure 4. This means that in the handling of the film during development there is relatively little chance of either under or over developing. Errors of the order of 25% in development time will have a much less marked effect on the Super Sensitive film. In other words the Super Sensitive film gives to the laboratory man that one thing which is so important to him and which is colloquially referred to as "development latitude."

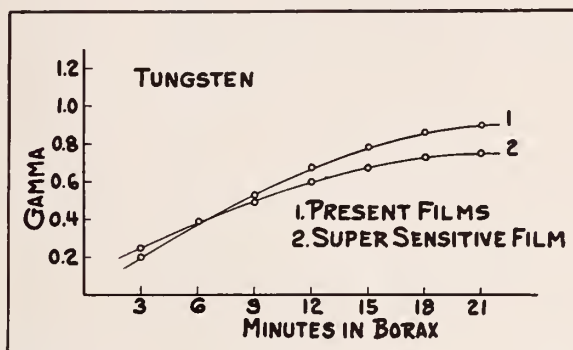


Fig. 4

There is just one caution which should be mentioned at this time. Due to the increased sensitivity of this emulsion, the handling of this film cannot be successfully accomplished unless the illumination from the present safelights is reduced appreciably. The ideal condition under which to handle this film would be total darkness and no doubt this condition will prevail inasmuch as many camera loading rooms and laboratories which process negative on machines now operate in almost, if not total, darkness. It is felt, therefore, that this will not work any great hardship on the laboratory. However, this word of caution is considered necessary because of the greater increased speed both to white and to colored light of the Super Sensitive emulsion.

It is felt that a summary of the outstanding features of the Super Sensitive film will bear repeating.

1—Super Sensitive film is twice as fast to daylight and three times as fast to tungsten light as the present type panchromatic films.

2—Super Sensitive film shows 75% more speed to blue light, 200% more to green light, and from 400 to 500% more to red light.

3—Super Sensitive film exhibits an appreciably softer characteristic than present films. For the same time of development the Super Sensitive film gives lower gammas. This makes it advisable to develop the Super Sensitive film longer if the same degree of contrast as now accepted is still desired.

4—Super Sensitive film must be handled at a much reduced light intensity in the dark rooms.

Johnson Business Head Cameramen's N. Y. Local

V. JOHNSON, formerly engaged in location work for the Paramount New York studio, has been named business representative of the cameramen's local in New York. He succeeds Francis E. Ziesse, who will soon announce a new connection.

Talking Movie Proves Effective Aid To Successful Selling

HOW THE talking motion picture is being used as a unique and striking aid to successful selling is told in the current issue of the Financial Advertisers Bulletin by Frederick Doyle, advertising director of Smith, Burris & Company, Chicago, central syndicate managers of Corporate Trust Shares.

It has been this company's idea that motion pictures, especially talking films, could be of effective help in selling investment trust securities, and the actual results of the first exhibitions of a three-reel talkie called "An Investment in America's Prosperity" have amply proved this, according to Mr. Doyle.

The theme of this talking picture, as shown on the screen and explained by an accompanying voice, is the closeness to the daily life of America of the companies included in the Smith-Burris trust portfolio. "The different companies are seen at work," says Mr. Doyle, "providing luxuries as well as necessities—harvesting food and bringing it to the table; supplying light, power and heat; providing rapid communication to any point on the globe; and performing a hundred other tasks essential to the very existence of our national life."

The picture is shown by salesmen in various cities. The film is supplied in standard size for regular theatre production and in smaller size for portable talkie machines. Of the portable talkie reproducers over fifty Bell & Howell outfits are now being used to exhibit the picture. This outfit weighs only 88 pounds and is so simple in construction that an office boy can operate it. "In whatever manner it is shown the production is a thrilling talking movie," says Mr. Doyle.

"One of the great difficulties that the bond and stock salesman must cope with," says Mr. Cedric H. Smith, vice-president of Smith, Burris & Company, who directed the production of the film, "is that of making his prospective investor realize the extent and nature of the income producing power behind the particular investment offered. Engraved certificates look much alike, and comparative figures mean little except to statistically minded people. But an investor seeing and hearing a great industrial plant in operation gets a vivid and comprehensive idea of the tangible factors back of his prospective investment."

"An Investment in America's Prosperity" is a Burton Holmes production. The companies whose activities are shown on the screen cooperated by supplying action scenes of their plants, operations and products. A total of 81,500 feet from these films was reviewed and scenes adopted, in addition to many thousand feet of new "shots" taken especially for this new picture. From all this material the picture was condensed to three reels rendering it interesting every second of every scene. The voice and musical parts were synchronized with the picture.

"It was not expected that the film would produce immediate sales," says Mr. Doyle, "yet dealers make such reports as this: 'Every time we run the picture a few more sales are closed. This week we have had a crowded showing every night. Next week we are making, in addition, a showing every day at 12:10 and another at 3:00.'"

College Board Will Study Sound Films in Education

R-C-A PHOTOPHONE engineers are installing sound apparatus in the auditorium of the State Teachers' College at Cedar Falls, Iowa. This is the first institution in the state to adopt the "talkies" and it is said the college board will make an intensive study of the value of sound pictures in education.

The Pedagogy of Visual Education

(Continued from Page 13)

The key to the successful use of slides and projection equipment is an administrative scheme which facilitates the convenience of their use. In conference with university professors it became apparent that the utilization of visual apparatus depended on its availability and the dispatch with which it could be made available. No one will maneuver administratively or act as an expressman to secure apparatus which he will use for no longer a time than it took him to secure it. Miss Probst attributes the extensive use of visual apparatus in her school to her making the materials available. In the Calhoun school there is an extension cord in every room. In the primary grades there is projection equipment for every two rooms and in the upper grades for every four rooms. There is a headquarters room for every unit of two or four rooms and the actual equipment and proposed use is scheduled on a chart and controlled from this headquarters room. Slides, pictures, views, film, etc., are filed in the principal's office by trained clerks and can be withdrawn for room use as easily as cards can be removed from an alphabetical index.

It is the opinion of instructors that there must be ample projection equipment for regular use. When equipment has to be booked for, transferred, set up, room arranged for its use, etc., the instructor does not use it. Equipment should be in rooms ready for use and if transfer is made, it should be limited to buildings in which the rooms are close together and possibly limited to a single floor. When buildings are planned, foresight should include special instruction for visual education. In physics department projection apparatus is generally an integral part of the lecture rooms' instructional equipment, and consequently is extensively used. Apparatus for visual instruction should be regarded as microscopes and books are regarded. No one thinks of limiting student groups to one copy of a book or one microscope. There are several copies of a book and many microscopes. One should regard visual apparatus similarly. There should be enough to be easily available for those who wish to use such equipment.

Wherever motion or activity is an important factor, films constitute a very essential phase of instruction. In the inland sections, remote from the ocean, films bring to zoology classes realism in instruction that otherwise would not be obtained. The teaching of sea life is quite barren without showing the motion and behavior of different forms of sea life. Films bring to the zoology student in realistic manner the behavior of the studied sea forms.

Psychology being a study of behavior can make extensive use of films to study reactions to specific situations where stimuli are controlled. Films are made of infants and preschool children, of rats in mazes, monkeys in cages, adults working puzzles and of many other situations.

In 1929 some of the eminent foreign psychologists brought to America films which depicted their experiments. Pavlov, the great Russian psychologist, had a film illustrating the conditioned reflex whose importance is attested to by its being the cornerstone, if not the foundation, of a large school of psychology.

When Koehler, the eminent German psychologist, was at Minnesota he showed his studies of monkeys by means of films. The films were without doubt the most efficient vehicle for pointing out in the actions of his monkeys, his theories of behavior. To illustrate the research of Pavlov and Koehler, visual presentation through the medium of the film seemed to arouse much more interest and impart better understanding than numerous lectures or pages of published material could have done. One can hardly attend a scientific meeting and not see the research of some eminent scholar on the screen.

In phases of instruction such as typewriting and penmanship where efficient coordination of movements that make up skills are being taught films can be made which illustrate

effective methods. Typewriting has been taught with unusual effectiveness by preparing films showing the techniques of experts. The film company that has engaged a national tennis and golf star to illustrate how to play the game of tennis and golf is entering into a field of pedagogy with limits for actual class room instruction that are very remote.

Education by means of films is not new by any means and yet only beginnings are made. Talking accompaniment is certain to be an essential instructional phase of teaching by means of films. When experts make a film it goes without saying that they can provide better oral explanations than can the average class room teacher on either grade, high school or university level.

The next important step will have to include the preparation of educational films by scholars and scientists. The technical phases of directing, photographing, recording, etc., are well in the hand of film companies with their auxiliary research laboratories, and this part of the problem is not the one referred to in the previous statement. What is meant is that educators, be they historians, physicists, psychologists, geologists, zoologists or what not, will have to devote themselves to the preparation of films in their different subjects just as they now prepare texts, monographs, and published articles.

It is conceivable that in many courses or subjects in grades, high school or college, the seeing and hearing of a prescribed number of films correlated with the courses will be considered as important an integral part of a course as the reading of assignments and the hearing of a fixed number of lectures. Just as book companies now announce new books in a subject or a field of study, some companies will announce new films in the various phases of study and learning which are available for instructional purposes. This is being done to some extent now.

At the University of Minnesota a committee on visual education is working to further and expedite instruction by means of projection apparatus. The interest is not merely an administrative one which concerns itself with effective use of available means, but one that looks forward to research and creative work in the production of instructional films. A depository for all available films is being provided which will really be a library of films, and, will function in regard to films as a library functions with its books and reading matter. It is the endeavor of the University of Minnesota to collect and save for the use of posterity films which normally are destroyed but which foresight speculates will have historical and research value in the future.



attention

The pictorial section of the next volume of the Cinematographic Annual is being compiled. Anyone wishing to contribute prints for this section may send them in now for consideration.



Still by George Hommel

JOAN CRAWFORD and LESTER VAIL

in

“DANCE, FOOLS, DANCE”

A METRO-GOLDWYN-MAYER PRODUCTION

Cinematographer, CHARLES ROSHER, A. S. C.

Make-up Artist, CECIL HOLLAND

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**Max Factor's
Panchromatic
and
Technicolor
Make-up
for the
Screen**

**Max Factor's
Theatrical
Make-up
for the
Stage**

Eastman Announces

THE GREATEST ADVANCE
THE INTRODUCTION OF PAN

A GAIN Eastman takes a great forward stride in emulsion making, with a motion picture negative film, the importance of which can be compared only with the epoch-making introduction of the first Eastman Panchromatic Negative.

Eastman *Super-Sensitive* Panchromatic Negative, *Type 2*, is now ready for you.

Here are some of its outstanding characteristics:

- (1) *It has at least double the speed of previous panchromatic emulsions.* This remarkable increase in speed promises substantial reductions in lighting expense on the set, and added hours of shooting time on location.
- (2) *It has an even finer grain than Eastman Panchromatic Negative, Type 2.*
- (3) *It exhibits a very decided, and very important developing latitude.* Because of this quality, the industry can be more confident than ever of getting the finest possible results in processing.

EASTMAN SUPER-

ANCE IN EMULSIONS SINCE PANCHROMATIC NEGATIVE

(4) *There is no increase in price over that of Panchromatic Negative, Type 2.*

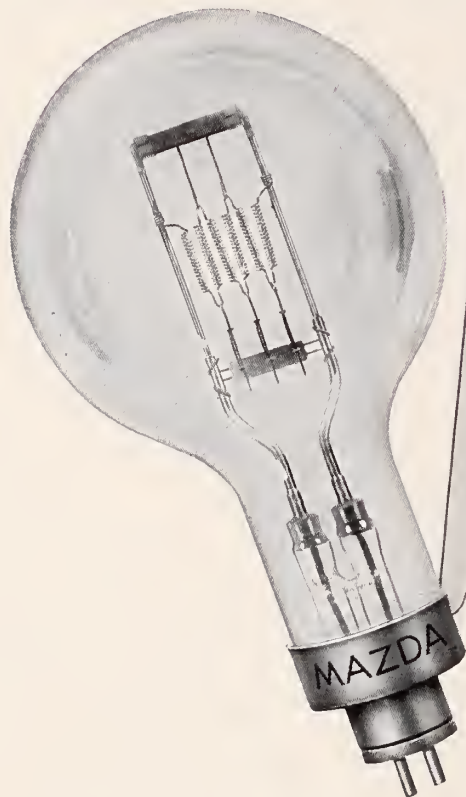


All of the improvements embodied in this new emulsion represent clear gain to the industry. For they have been made without sacrificing or impairing any of the desirable features of Eastman Panchromatic Negative, with which camera men are familiar. True color balance . . . unsurpassed exposure latitude . . . ability to render fine shadow detail . . . tough, wear-resisting base . . . splendid uniformity . . . all these qualities are as prominently present as before.

Eastman *Super-Sensitive* Panchromatic Negative, *Type 2*, represents a real achievement. You will want to become thoroughly familiar with it. The best way to do that is to use it in your next picture. . . . Eastman Kodak Company, Rochester, New York. (J. E. Brulatour, Inc., Distributors, New York, Chicago, Hollywood.)

PIR-SENSITIVE PANCHROMATIC NEGATIVE ...*Type 2*

MAZDA . . . NOT THE NAME OF A THING BUT THE MARK OF A RESEARCH SERVICE



AGAIN..THE BEST USED MAZDA LAMPS . . .

1930'S BEST PICTURES

ALL QUIET
 ON THE WESTERN FRONT
 ABRAHAM LINCOLN
 HOLIDAY
 JOURNEY'S END
 ANNIE CHRISTIE
 THE BIG HOUSE
 WITH BYRD
 AT THE SOUTH POLE
 THE DIVORCEE
 HELL'S ANGELS
 OLD ENGLISH

AGAIN in 1930, MAZDA lamps played an important part in the production of the best pictures of the year.

This predominance of MAZDA lamps for lighting as well as for recording and reproduction of sound is significant. Of the ten best pictures, seven used MAZDA lamps exclusively, while two of the others used MAZDA lamps in part.

Every type of General Electric MAZDA lamp used in motion picture photography is the result of millions of dollars and many years spent in research and test applications. That MAZDA lamps should contribute to the outstanding success of the year's best pictures is not only logical—it is inevitable because the past achievement, present acceptance and future promise of MAZDA lamps have made them indispensable to the cinematographer.

The continued identification of G. E. MAZDA lamps with the best productions is assured by their quality, and by the devotion of the engineers who constantly improve them to the cause of ever better cinematography. National Lamp Works of General Electric Company, Nela Park, Cleveland, Ohio.

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Erpi Consolidates Forces

CONSOLIDATION of all field forces of Electrical Research Products is under way, according to a statement issued by H. M. Wilcox, Vice President in charge of operation. The first step in the merging of departments was effected February 1 when the Installation and Service Departments were consolidated.

"The increasing variety of activities which the Installation and Service Departments are being called upon to handle has made it desirable in the interest of greater flexibility to consolidate the field forces and to rearrange territories so that the

sales, credit and operating divisions will synchronize, thereby effecting an even closer coordination," stated Wilcox.

In the consolidation of Service and Installation, the two departments become the Operating Department with J. S. Ward, formerly Service Manager, appointed Director of Operations, reporting to Wilcox; and L. W. Conrow, formerly Installation Manager, becomes Operating Manager, reporting to Ward.

The four Installation Divisions and thirteen Service Divisions will be consolidated into five Operating Divisions each under the administration of a manager, who will be completely responsible for both installation and service activities.

AUDIO-CAMEX

Sound-on-Film Recording System

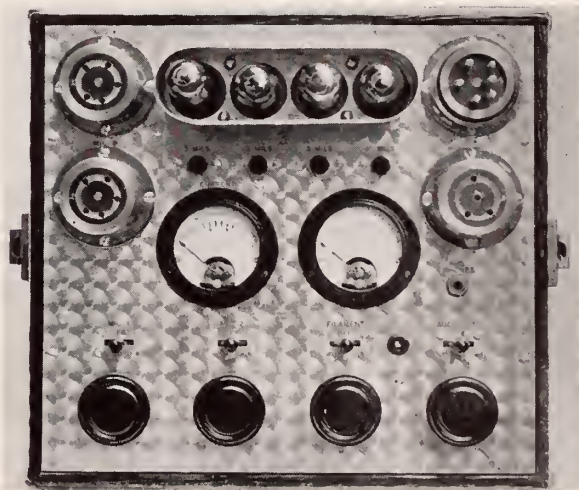
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LABORATORY and TECHNICAL MATTERS

by EMERY HUSE, A. S. C.

For a long time we have felt that a special department devoted to laboratory and other technical problems would be a feature that would be welcomed by the readers of this magazine. Starting with this issue we are pleased to announce that such a department is now at your disposal, and is conducted by Mr. Emery Huse, A. S. C., technical editor of the American Cinematographer. Mr. Huse, whose picture appears at the left, needs no introduction, for his work with the Eastman Kodak Company has stamped him as a recognized authority. If you have any problems, send them into this department and they will be answered. —The Editor.

Screen Brightness

THE QUESTION of screen brightness has arisen on many occasions but there seems to be very little definite data available as to what brightness should be maintained on motion picture screens. A review of the literature failed to show any definite recommendation of specific brightness values for motion picture films but it may be inferred from the experimental data in various articles published that an optimum value of screen brightness about eight years ago was 10 foot-candles. During the past year the Academy of Motion Picture Arts and Sciences has had a committee in operation called the Screen Illumination Committee, whose purpose it was to study screen brightness. The Society of Motion Picture Engineers for years had had a Theatre Lighting Committee, part of whose work was a study of the screen brightness subject.

There are occasions arising where a picture shown in two different projection rooms, or theatres, will look quite different on the screen. Reference is made particularly to the same print. Oftentimes as a result of the difference, blame is placed on the projectionist or on the laboratory for their print quality. In most instances the cause of this difficulty can be centered in the inequality of the brightness of the screens on which the picture is viewed.

This general problem of screen brightness is of great magnitude and extends from the processing laboratory through the studio projection rooms to the screens of the multitude of theatres throughout the country. It is naturally quite impossible at this time to make a standard condition which would please all parties concerned but it does seem that at least within a given studio the various projection rooms could be maintained at some definite screen brightness. Furthermore, in making a study of various theatres and studios relative to their screen brightness the values are not greatly in disagreement but they are sufficiently so to make standardization impossible. Theatres agree among themselves fairly well, but the studios are not as good in this respect.

The purpose of this article is simply to bring to the attention of those interested a tabulation of some of the data available at the present moment, which data was accumulated during the past year. The accompanying table gives rather completely such data.

Color Coefficient

THE SENSITOMETRIC term "color coefficient" has been brought into the motion picture vocabulary since the introduction of sound photography. An attempt will be made here to briefly explain its significance.

Screen Illumination Data For Several Los Angeles Theatres

THEATRE	TYPE	LENGTH OF THROW	TYPE OF SCREEN	SIZE OF SCREEN	SCREEN ILLUMINATION FOOT-CANDLES
A	Neighborhood	100 ft.	Transvox	13' 2" x 17' 8"	8.5 f. c.
B	"	99 ft.	"	13' 2" x 17' 8"	10 f. c.
C	L. A. Class A House	100 ft.	Datone X	14' 3" x 19'	10.5 f. c.
D	Hollywood Class A	95 ft.	Transvox	18' 6" x 24' 7"	11 f. c.
E	Hollywood Class A	75 ft.	"	14' 6" x 19' 4"	12 f. c.
F	Neighborhood	125 ft.	"	13' x 17' 5"	9 f. c.
G	Laboratory	65 ft.	Datone X	Exact dimension unknown	12 f. c.
H	"	35 ft.	Not sound screen	" " "	24 f. c.
I	"	45 ft.	Datone X	10 x 12	17 f. c.
J	"	35 ft.	Not sound screen matte surface	7 x 9½	38 f. c.

The color of the silver deposit in a photographic negative exerts a marked influence on the quality of the resulting print, thus negatives made with certain developers exhibit decidedly yellowish deposits, while other developers produce images that are almost entirely colorless. Of two such negatives having the same visual quality, except for the differences in color, the yellowish one will produce a print of higher contrast. The reason for this can be determined only upon a consideration of the difference between the visibility function of the eye and the spectral sensitivity of the photographic printing material. A deposit which is yellowish, therefore, will have a lower total transmission when measured by using some photographic material, such as positive film, as the receiving surface for the transmitted radiation, than when measured by a visual method in which the retina of the eye is employed, as the lighter sensitive receptor. It is quite evident, then, that in the study of the negative a careful distinction must be made between the total visual transmission and the total photographic transmission of the silver deposits which compose that negative. Color coefficient may be defined as the factor by which the visual contrast in a negative is increased in the print due to the color of the negative silver deposits. If the negative deposits are neutral in color then the color coefficient is unity.

In studying various developers it has been found that a pure elon developer, one containing no hydroquinone, gives the clearest image. The color coefficient of a pure elon developer approximates 1.03 to 1.05, showing an increase in gamma of from three to five percent over a negative with colorless deposits of silver.

Developers of the type used in the processing of sound film show color coefficients in the neighborhood of 1.10 to 1.20, the actual value depending upon the construction of the developer and the manner in which the film is processed in it.

For developers of the pyro type in which a definitely stained image is obtained, color coefficients of the order of 1.30 to 1.40 are quite usual.

In the discussion of color coefficient the word "color" may be a little misleading. Unless the negative has a decided color very little color will be observed when that negative is inspected visually.

Series and Parallel

DRY CELLS used in battery sets illustrate series and parallel connections nicely. Dry cells are used to light the filaments of dry cell type radio sets. With tubes like the 199, three dry cells in series are required. The voltage is then tripled (each cell is $1\frac{1}{2}$ volts). The current capacity of the cell remains the same as that of one cell, however. For other tubes, such as the WD11, only $1\frac{1}{2}$ volts are required, but one cell does not have enough current capacity to light all the tubes of the set. Therefore a number of dry cells, any number desired, is connected in parallel, that is, with their positive terminals joined together, and their negative terminals joined together. This acts as a single dry cell, still of $1\frac{1}{2}$ volts, but of greater current capacity.

Models of Sets Prove Most Efficient Method

PARAMOUNT'S New York studio has inaugurated a policy of making models of sets, drawn to $\frac{1}{2}$ inch scale, which are used in preference to sketches. By means of these models, the director can visualize the entire action before the picture goes into production and may plan his picture accordingly. Cameramen, electricians and carpenters also benefit by studying the models in figuring out camera angles, lighting effects and anticipating difficulties in construction. The plan, now in effect under the supervision of William Saulter, Paramount's head art director here, has proven a great saving in both time and money.

High Speed Camera Analysis of Energy Expenditure

THE AVERAGE college sprinter in the 100-yard dash utilizes oxygen at a rate which is equivalent to the production of 13 H.P., according to the results of physiologists who have been studying the problem. With the aid of the high speed motion picture camera, an analysis has recently been made of the actual mechanical work done by these runners, who were picked at random from the gymnasium classes of the university.

From this investigation it was found that only about 3 H.P. are returned as mechanical work which could be accounted for by the movements of the various parts of the body. This makes the human machine only 23 per cent efficient.

By measuring the displacements of the body structures as they appeared when projected on a screen from over 2,000 separate film pictures, it has been possible to compute the velocities of the arms and legs during their swings. The results showed that more than half of the mechanical work was required to swing them and that 0.7 H.P. was expended to stop them at the end of the swing, making a total of 2.4 H. P. utilized in the arms and legs. The overcoming of the resistance of the feet making contact with the ground required 0.4 H.P., while wind pressure and gravity accounted for 0.2 H.P.

Bausch & Lomb Design Lens for Wide Screen

BAUSCH & LOMB OPTICAL CO., Rochester, N. Y., is now marketing its new super cinephor lens and condenser system, said to have been especially designed to meet the requirements of the wide screen, as well as to improve standard films. This is the first projection lens to be fully corrected for astigmatism, the company claims, hence the improved flat field and critical definition.

The condenser on its operation confines the light to an evenly illuminated oval of the same proportion as the wide film aperture dimensions, giving 50 per cent more illumination, the company states.

More Color

IT IS reported that a limited liability company with a capital of 3,500,000 francs has just been formed in Paris for the production of colored film. The name of the concern in question is Societe Continentale Europeenne Cinecolor. The board of directors is composed of Louis Aubert, Marcel Monteux, Leopold-Maurice Gratioulet and Gustave Dyckhoff. The new company is to exploit the so-called Thornton color process, the patent of which is held by John Edward Thornton, of Jersey, England.

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Amateur Movie Making

◆ by HAL HALL ◆

WE HAD hoped that Mr. Stull, who conducts this department, would be well and back at his desk in time to write for the March issue. However, such is not the case. Just as he began to feel somewhat like his old self he was stricken with appendicitis. At this writing he is on the road to recovery and asks us to send his best wishes to those who read his department each month. So, you will have to bear with me for another issue.

At this particular season of the year, between winter and spring, many amateurs feel that there is little chance to use their 16 millimeter camera. They look through watery windows at the driving rains, at the cloudy skies or the bleak landscape. Then they long for the sunny days that are to come. Few realize that they are passing up the opportunity of making subjects that are unique and really worthwhile.

There is nothing more interesting than a subject photographed in the rain. With the fast lenses of today, dark days are not what they once were to the photographer. In fact, untold possibilities are revealed, and from an artistic point of view the amateur may make a screen picture of much greater pictorial interest than in the summer days when the sun is blazing down and not a cloud is in the sky. The great banks of drifting clouds alone furnish pictorial attractiveness that one should not fail to take advantage of. Dark clouds, dripping rain, unusual reflections on wet pavements, distant landscapes veiled with a moody mistiness, light coming from a flatter angle, making it possible to secure artistic effects closer to the middle of the day than you can a month later—all aid the amateur in making pictures that will be little jewels in his collection.

An interesting series of pictures for a serious amateur may be made during the four seasons of the year. Select a spot that lends itself to pictorial beauty. Photograph it in the middle of winter when the ice and snow covers all. As spring arrives with budding leaves and drenching rain, photograph it again. And then when summer is here and the entire scene has changed, photograph it in kodacolor. As the climax, again in kodacolor, photograph it in the autumn when it is bathed in the gorgeous colors of that season. If well thought out and intelligently photographed, you will have a picture you will be proud of, and which will challenge your cinematographic ability.

While on the subject of rainy day photography, this writer has often wondered why the general run of amateurs puts the camera away on a rainy day. He may be making a trip around the world, and recording it on his film. But—if it rains when he is in Boston he usually makes no pictures. Why not? It seems to this writer that what you want is a photographic record of the trip. Why not make it in the rain if it is raining? Those may be the best pictures of the lot. A friend of mine recently showed me some pictures he had made while on a trip to Alaska. It rained a large part of the time he was there, and—the best pictures he had were those made on the rainy days. There was a certain air of mystery about the mountains with the mist and clouds that fairly made one gasp with delight. Why not try it?

Filters

The subject of filters seems to be a fly in the ointment to many amateurs, judging from the number of questions that reach this office. Many ask why they should use filters. Many ask how to use them.

In the first place, color-filters are a means of correcting the discrepancies between the way the film sees colors, and the way our eyes see them. That is, the film sees colors according to one scale of brightness, and our eyes see the same colors with quite different degrees of brightness. If we arrange a strip of cardboard painted blue-violet at one end, and graduating through the entire spectrum to red at the other end, with yellow approximately at the middle, our eyes will register the middle section as being the brightest, with both ends shading off deeper and deeper. But if we photograph this same colored strip, we will have proof that the film sees color very differently from the way we do, for our picture will be brightest at the blue end, and then shade down to an almost dead black in the red section. This is because the blue light (and, beyond it, the invisible ultra-violet) is the most active photographically, while the red is almost inert. Therefore, if we want to get anything like a true rendition of the color-values our eyes see, we must in some way hold back a portion of the powerful blue rays, and give the weaker greens, yellows, and reds a chance to make their impressions upon the film. That is what light-filters are for. The better grades are so made that they not only retard the blue rays, but quite absorb the invisible ultraviolet frequencies. But, in order to work under all conditions, we must have a variety of filters: some that hold back only a little of the blue, and some that hold back a great deal of it. Therefore filters are made in several grades, the light-colored ones holding back only a moderate part of the blue, while the darker ones retard more and more of it. However, no commercial filters hold back all of the blue rays, for that would be as serious an exaggeration in its way as the original condition the filter is intended to correct is.

Now, when these filters are used, it will be seen that they are removing a portion of the light (and the most active portion, at that), but they are not adding anything to take its place. Therefore, in order to keep the exposure correct, a longer time must be given, or a larger amount of light allowed to work on the plate: and this increase must be directly proportioned to the amount of blue light cut out by the filter. In amateur movie work, where the time of exposure is usually fixed, this compensation must be made by opening the diaphragm on the lens. In order to make this compensation accurately and conveniently, the manufacturers have determined what is known as the "filter factor" for each of their various filters. There are so many different makes of filters on the market today that it would be impossible to give here the factors of anything like a comprehensive number of them; however, among the most popular ones are the "Wratten" K series made by the Eastman Company, and of these the ones most used in amateur movie-making are the K 1, the K 1½, and the K 2. The lightest of these, the K 1, absorbs 60% of the blue rays, and passes nearly 80% of all the others; its

(Continued on Page 35)



THE PICTORIALIST

by FRANK TANNER

Going To Try Directing?

An Amateur Advises Amateurs

by ORLTON WEST

We are more than delighted to give you the accompanying article by Mr. Orilton West, because he is one of the best known amateurs in Great Britain. He has directed many fine amateur films, with "Waitress" as, perhaps, the most outstanding. This was made for the London Film Guild.
—The Editor.

|| 'M GOING to have a shot at directing my first film this spring," a friend announces.
"How do you do it?"

"It's quite impossible to explain **how** one does these things," I informed him, but I passed on to him, and now, in this article, pass on to you, the unripe fruits of a brief experience in the matter.

The more one watches other amateur film directors at work the more one realizes successful results to be due more to science than to art, more to deliberate study and application of psychology than to a black hat and the 'artistic' temperament.

Generally speaking there are two distinct types of directors common both to the amateur and commercial film studio; the one, noisy, driving, 'schoolmasterish;' the other, quiet, calm, and self possessed.

The former cannot hope to obtain useful results from his ravings, because as soon as he gets annoyed and behaves like a spoilt uncontrolled child, one or other of the players follow suit, either privately to themselves or openly to everyone. In either case concentration on the real work in hand goes to the winds. Noisy argument breaks up order, and the resulting atmosphere of strain muddles the acting side of matters.

On the other hand the quiet director, although his presence may be scarcely noticed by lookers-on, dominates and guides his players with his **personality**. They trust him most when he says least—and is thinking. The few necessary words he does utter carry weight.

Robots and Actors

Always prepare your cast for direction with an outline explanation of the scenes to be 'shot', then go on to tell them anything they might want to know (especially if they do not ask) about the scenario in order according to the **story**, not according to your working script which is intelligible only to technicians.

This is important, because the players can only generate correct degrees of expression for present scenes if they know how they match up with past and future ones. There is never any excuse for treating any member of the cast merely as a robot performing to your orders.

Some people I find do much better without detailed direction. Really good players (and there are some—if you look for them) are best left to themselves. Once they know the general situation, atmosphere, and points to be conveyed in the scenes on hand, they will direct themselves naturally. Many members of the cast will listen intently to every word you have to say. They belong to a different type, who feel the 'teacher-child' or 'you know everything, I know nothing' attitude towards you. They project their personalities upon you as representing the part they are about to act, and your detailed directions give them self confidence. To successfully handle these folk form the real test of your directorial abilities.

The amateur film director must train himself to be very versatile. When working on exciting scenes such as fights or love quarrels, fold up your quiet manner for a time and put it away. Try and work yourself into an appropriate emotional passion, some of which will be transmitted to those under your direction

Alternatively, when engaged on a quiet domestic scene, switch back to the calm ludo (**not** Lido) mood at 9 p. m.—in short, have control of yourself before hoping for control of other people. Incidentally, it is wise to free the studio from all those not directly engaged in production while guiding difficult pieces of acting. Continuous gaze, whispered criticisms, and a general atmosphere of petty jealousy created by other and less fortunate members of the club may worry your players—and the finished results too!

Overcoming Shyness

Competent casting lightens the directors' job, and is essential if you are going to give the whole film and its best players an honest chance. If you want lovers try and find a couple who are real lovers, or at any rate who can get on quite well together. This omits the preliminary overcoming of little repressions, and shynesses, which you may find most trying.

It is in this matter of casting where the amateur has advantages over the commercial director, who is often tied to a 'star' who may be a mother in one film and a daughter in the next—one of these parts must be miles removed from that star's real personality and outlook—poor 'stars.'

Look carefully around your club for the desired type for a particular character. If unlucky, it is sometimes better to seek outside the club circle and import a new member than to accept second best. Small part players may be chosen from almost anywhere, and while giving priority to club members, I have chosen ideal minor parts from passers-by in the street, and these people, because they were perfectly naturally themselves assisted the chief players by forming living backgrounds to their performances.

Some people become nervous outside the studio. They dislike a street crowd of lookers-on who stare at them, just as they would at a fire, cat, burglar, or male dress reformer! The best way out of this difficulty is to rehearse the scene against the correct background, while the passers-by gape to their heart's content, then go for a brief circular walking tour, and return to shoot the scene before the inquisitive ones have time to collect and exert their fatal hypnotism. In preparing or assisting to prepare the scenario, you can aid both yourself and your players by always giving them something, some symbol to act to.

It is unfair to stand the villain against a wall and say, "Now look as though you felt lustful—remember you are supposed to be thinking about bad girls." He will, unless he be a very good actor, find it as difficult as trying to catch the seaside holiday spirit at the Public Baths on a Sunday morning. Should the 'bad girl' not be in the same shot, he can at least be looking at a photograph, poster, or something suggestive of her, which incidentally, visually indicates his thoughts to the audience. There are the actors, the audience, and the film as a whole to be considered—all along.

The Man on the Cover

An Intimate Glimpse of a Professional Amateur

by **JOHN PARKER**

HE PORTRAYS perfect gentlemen in pictures—but in real life he is a rough and ready outdoors sportsman. He was born in London and educated in the conservative halls of an English university—but he prefers ranching in the wild and woolly American west to the life of an actor or cosmopolite.

He was noted as one of the finest young actors on the London and New York stages—but he likes California so much that he has been a permanent resident ever since his arrival five years ago.

He first came to Hollywood to play one of the featured roles in "Beau Geste," and recently he portrayed the title role in the sequel, "Beau Ideal."

He is married to one of the most celebrated actresses in the world, Ruth Chatterton—but he is also a star in his own right.

He is one of the finest hunters, fisherman, all-around sportsman and amateur photographers we know.

He is the man on the cover.

His name is Ralph Forbes.

And, just to prove to you that he is a really clever amateur photographer, we now inform you that he made the unusually striking picture of himself on the cover this month himself, using an automatic device to work the camera.

No more fitting picture of "the other side" of this man could be revealed than this cover. Fated by birth, breeding and education to portray the character of the perfect gentleman in pictures and on the stage, Forbes presents the most amazing anomaly in Hollywood. To the picture world and the theatregoers, he is the beau ideal, the Chesterfield, the epitome of gentility. While he undoubtedly possesses all of these blue-blooded attributes, there is another side to his real character which is known only to his few intimates. The picture on the cover, made in the high Sierras, gives us the real Forbes.

Here is one of the least-known actors in the public eye. How many people, even in his own profession, know that Forbes enjoys every vacation between pictures hidden far off from civilization in the wilds of the high Sierras, hunting and fishing and photographing? He is one of those rare humans, of this effete world, who honestly gets his biggest kick out of life in roughing it. Packing in over the back trails to some choice and secret spot to both photograph and hunt wild game, enduring whatever hardships come with the fun—this is Forbes' idea of the proper life for a man. Give him a gun, rod, camera, pipe, horse and dog, and strange as it may seem to those who follow his screen roles, he is far more at home than he is in the drawing room. In his private opinion, the only place for the drawing room is the screen or stage.

In his study and workshop, amid his collection of guns, rods, tackle, trail maps, trophies, cameras, complete sports equipment and an amazing array of surgical and medical "first-aids," I found him one of the most "different" of actors.

"I was educated as a lawyer, and later trained as an actor," said Forbes, "but I would have preferred being a doctor. That is, providing I could have been a good one. To my way of thinking, physicians and surgeons do more good for the human race than any class of scientists."

"See this instrument. I had to perform a minor operation on one of my guides while on a hunting trip, to save him from possible effects of a serious injury. You see, I have always had the natural bent."

This chap is full of such surprises.

"I have no desire to live in New York or London," he frankly admitted. "Yes, I was born in London and I love my native England, but I much prefer to live in California. Not this California, penned in close city quarters between the mountains and the sea, but in the real California where the old west is still unspoiled by civilization. Not very far from here, in fact less than a hundred miles, I could show you a large ranch where the west is still the west. There are many such places back in the Sierras, and I am now negotiating the purchase of a thousand-acre ranch where I can enjoy life to the utmost. Being monarch of all you survey, isn't a bad idea, is it? My profession is acting, but for pleasure give me ranching. Nothing will suit me better than to be able to run cattle on the place and to stock it with a few fine horses. Outside of the stock and new quarters, it will remain just as it is—the primitive."

Forbes is that type of English sportsman who was born to the outdoors, horses, guns and dogs. He could never be happy without this life. He has found it in southern California.

In my opinion, "Beau Ideal" fell short of "Beau Geste" as a story and picture. However, Forbes said he welcomed the opportunity to change his evening clothes for the rough prison garb and colorful Foreign Legion uniform. He even grew a beard for the prison sequence. He won praise from the critics for his fine characterization, even if the picture proved a bit disappointing.

"Talking pictures?" he smiled at the usual query. "Although I shall never cease to be grateful for the opportunity the movies gave me five years ago, I must say that the talking picture has progressed more in two years than the silents did in ten. All one has to do to fully realize the tremendous advantages of the new form over the old, is to see Ronnie Colman in 'The Devil To Pay', and to hear Frederick Lonsdale's priceless lines."

In 1923 Forbes was recognized as one of London's most promising young actors. He came to New York to appear in a war play, 'Havoc.' He never returned. Here he met Ruth Chatterton in 1924, and they were married after a whirlwind courtship. Before coming to Hollywood he appeared in three plays, which led to Herbert Brenon selecting him for one of the three Geste brothers, along with Ronald Colman and Neil Hamilton. Local theatregoers have had fine examples of his stage ability. He appeared opposite his wife, Ruth Chatterton, in Michael Arlen's 'Green Hat,' and with Edward Everett Horton, Lois Wilson and his mother, Mary Forbes, in 'The Swan'.

Interesting people always present strange contrasts. This stalwart, blonde, blue-eyed young Englishman may be fated to continue playing drawing-room roles in pictures. But, after seeing the other side of the man, one can't help wishing that fate will soon bestow upon him a rough and ready role into which he can sink his dramatic teeth.



When You Take Your Movie Camera Abroad

MORE and more, travelers are taking amateur movie cameras with them when they fare abroad. They are doing this because they find that these little instruments enable them to capture foreign life in action—just as it is lived. And when they return to their homes, they have only to throw their movies on the screen to relive the joys of their travels over and over again.

Because of the increasing vogue of travel movie making, we are sure that it will be found worth while to make a few practical suggestions as to taking camera and film to foreign countries.

With regard to the camera itself, special precautions are necessary in taking care of the lens, because moisture is very apt to condense upon it, leaving a slight deposit which will interfere with the possibility of good results. This seems an unimportant point, but a dirty lens can spoil many dollars worth of film. One firm manufactures a special lens cleaning outfit, the price being nominal. Other than the matter of keeping the lens clean, no special precautions as to the care of the camera are necessary beyond the actual instructions issued with every instrument sold, except to avoid getting sand, dust or water in the mechanism.

Film can be bought in this country and taken abroad; in fact, it is generally cheaper to do so because the price in the various foreign countries is usually the same as in the United States plus an import duty.

However, films can be purchased at almost any of many photographic supply houses abroad, and development of their particular make of reversal film is undertaken without additional cost at numerous laboratories maintained in foreign countries by film manufacturers. All film is adequately packed for normal use but, if a prolonged stay in a tropical area is anticipated, film should be purchased in special export packing for which there is a slight additional charge.

At the present time there is a duty on amateur motion picture film and equipment entering certain foreign countries which, in the case of travelers making a record of their tours, is not often enforced. The experience of the great majority is that a small supply of film for personal use, together with their cameras, is admitted practically everywhere without restriction.

In some countries the traveler is occasionally required to deposit an amount on the movie camera and film approximately equal to the import duty. This amount is refunded if the material is taken out within a specified time, usually six months.

The United States Tariff Act of 1930, now a law, provides that motion picture film exposed abroad, whether developed or not, if of American manufacture and if not to be used for commercial purposes, may be brought into the United States duty free. This free entry may be made into the United States possessions overseas as well as the mainland, with the exceptions of the Philippine Islands, the Virgin Islands, American Samoa and the Island of Guam.

Before leaving this country on a trip abroad, it is especially suggested by the Bell & Howell Company that you register your camera, lenses, film, etc., with the customs office at the port of departure, using Form No. 4455. This will save all argument as to American origin when you return.

After you have replaced your exposed film in the round black metal case which is furnished with all 16 mm. film, place the case in your paper carton or metal sealing case but do not reseal. If you wrap the entire package in several layers of ordinary newspaper it will help wonderfully in preventing deterioration from moisture.

It is recommended that all travelers have an occasional roll of film processed abroad if possible, so as to afford an opportunity of checking their results. If you have film processed abroad, it is advisable to avoid mailing it across international borders, as delays and difficulties invariably occur. Many

travelers prefer to bring most of their film home with them to have it processed at a domestic laboratory with whose work they are familiar. NOTE: At the date of writing, all film processed in Italy must be censored in Rome before leaving the country. This is a long procedure and should be avoided if possible by having film processed after leaving Italy.

The experience of the majority of travelers is that no trouble or restrictions are encountered by travelers.

The laws evidently are not intended to operate against the amateur; therefore, film is generally admitted free providing it is carried in the owner's personal baggage.

Another Milestone

COMPLETING a quarter century in motion pictures Carl Laemmle, president, Universal Pictures, reviewed not the kaleidoscopic development of the industry but turned his thoughts to 25 years hence picturing advancement rivalling the imagination of Jules Verne.

Outstanding film pioneer and the only independent producer and distributor remaining in the industry, Laemmle believes the great major changes in film entertainment that have occurred in recent years are nothing compared to those to come before 1956.

"In 1906 automobiles were running on rubber and gasoline and they will do the same in 1956 but motion pictures are revolutionized every few years and the changes to come will dwarf all of the recent marvels of our progress.

"25 years from now motion picture theatres will present pictures direct from the studios by television; news weekly films will be sent by television. Hence a shipwreck in the China sea will be broadcast to all the world within a few hours after it is photographed. I think the motion picture is now one of our greatest educational factors and within a few years school houses will be equipped with television sets which will permit famous educators, surgeons, musicians and lecturers to make a motion picture and then have it broadcast to the world while they themselves take up other work.

"We are living in an age of miracles and the imaginary developments of today will be actualities to our children. I took up motion picture work because it was fascinating. I have found the service of my pictures to the public a tonic which gives me pride, courage and youth. Old? I'll never grow old so long as my company can entertain the world and I know that I am bringing enjoyment, enlightenment, encouragement and happiness to millions of people in all walks of life."

In a recent presentation of a golden scroll in behalf of the entire film industry, Will H. Hays, film czar, stated "Mr. Laemmle's career is the history of motion pictures."

Fast Service

THE TWENTIETH Century combination of ERPI Service and Airplane Travel again saved a show, the theatre involved in the most recent incident being the Plaza, Great Bend, where trouble developed at three o'clock in the afternoon.

The manager located R. S. Murphy, ERPI service engineer by telephone at the Tucker Theatre, Liberal, Kansas. A quick airplane trip got the engineer at Great Bend by six o'clock.

As the result of a long distance telephone call an amplifier had been shipped to the theatre from Kansas City and was waiting when the service engineer arrived, but proved to be unnecessary.

The trouble was diagnosed as a short circuit in the condenser and was remedied by the substitution of a temporary plate from the B battery by 7:25, in time for the evening show to go on. After the performance was over a complete bank of new condensers was substituted.

Screen Definition

(Continued from Page 15)

Moore filter No. 1 (No. 64 and 27) is recommended when as an example a sunset over water is photographed, reducing sun to a definite disc, but maintaining characteristic details and contrasts on water reflections.

This is the densest combination filter of the series of six published in a previous issue.



Fig. 4



Fig. 5

It is unfortunate that the selection of proper filters or filter combinations for especially desired effects is in each instance a delicate problem, the solution of which so greatly influences final screen definition.

The great number of conditions, above cited, call for careful consideration of their relative values and no set rule can be given for correct filter use.

The chart Fig. 1, however, offers certain assistance for these problems and has been found of reliable value.

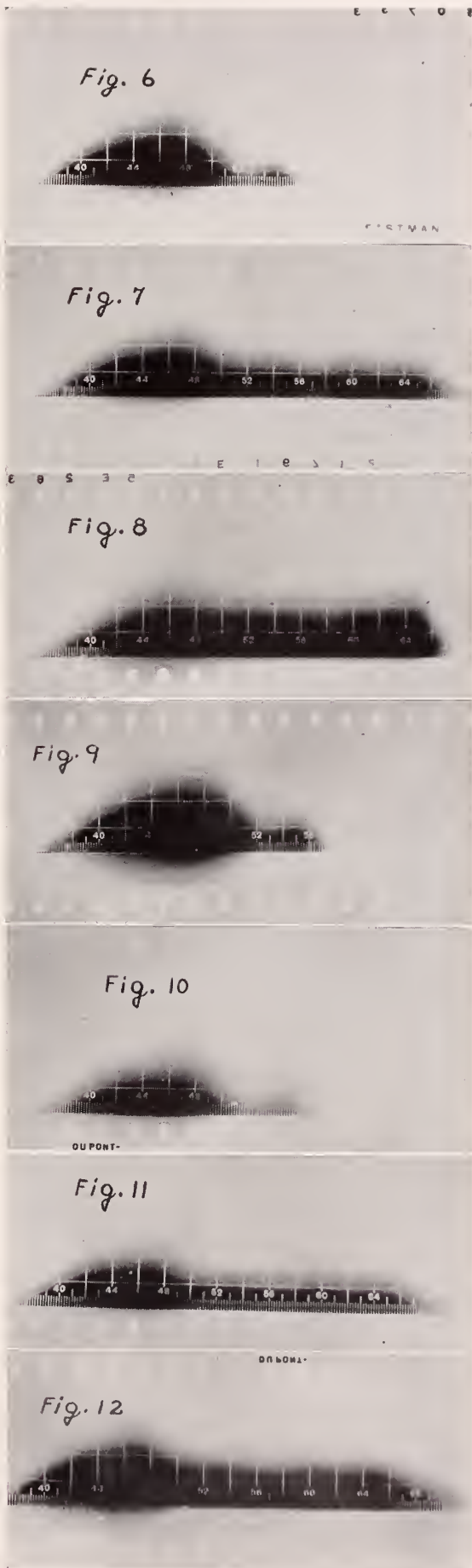
It is, however, of prime importance to always keep in mind that any filter—1, invariably reduces lens speed and 2, that it increases the actinic reaction for its complementary color value but only relative and never absolute.

In the next article a complete list of 20 Moore filters with their approximate multiplication factors and their individual characteristics will be published as a valuable guide for filter work.

Amateur Movie Making

(Continued from Page 30)

"filter factor" is 1.5. That is, when using a K 1, the normal exposure must be multiplied by 1.5. With the K 1 1/2, the factor is 2; and with the K 2, it is 3. Therefore, in practical use, with a K 1 the diaphragm opening should be increased half a stop; with a K 1 1/2, a full stop; and with a K 2, a stop and a half. In other words, if a scene required f:8 as a normal, unfiltered exposure, it would require f:6.3 if a K 1 filter were used, f:5.6 with a K 1 1/2, and f:4.5 with a K 2; all of which is a powerful argument in favor of the use of large-aperture lenses.



Cluck, Cluck



IF STUDIO picture makers think that stars are temperamental and difficult to handle, they should try their skill on a bunch of hens, says C. L. Venard, famous maker of Farm Films, of Peoria, Illinois. Mr. Venard sends the above picture along to show the studio workers just what the boys outside are doing.

New Filmo Educational Booklet

EVERYONE interested in the use of motion pictures in the educational field will want to read the new booklet, "Filmo Motion Pictures in Visual Education," just issued by the Bell & Howell Company.

Among the many important subjects treated is that of the use of sound movies in education. Sound is bound to come; as a matter of fact it is here now. This booklet tells how the sound picture can be profitably and economically introduced into actual every-day use in school and college.

"Finding Films for School Use" is the title of an especially valuable section of the booklet. Teaching films are as necessary to modern education as textbooks and wall maps, and helpful suggestions are given as to how to secure a worthwhile supply of educational films.

How schools can make their own movies is another extremely vital topic that is interestingly discussed, as is also the important subject of how to care for 16 mm. films.

A section entitled "Pointers for Projectionists" is sure to be of tremendous usefulness. Included in this section is a valuable table showing picture sizes obtainable on the screen by Filmo projection lenses of different focal lengths.

The booklet is rendered particularly timely due to the fact that it carries the news of the recent development of the powerful 75 volt 375 watt lamp for 16 mm. projection—a lamp which, by making possible the entirely adequate projection of 16 mm. black and white film to a width of 12 feet, opens up a tremendous new field for the amateur size film in school and college.

A list of typical installations of Filmo equipment is Universities and Colleges, High Schools, Public Grade Schools, Private and Parochial Schools, and Associations of educational significance, is notably impressive.

Copies of the booklet can be had free on request to the Bell & Howell Company, Educational Department, 1801 Larchmont Avenue, Chicago.

Paramount Color

A NEW three-color additive process, which it is reported Paramount will have ready for general use in about one year, costs only approximately 1½ cents a foot more than black and white, it is understood. In other words, total cost is 4½ cents a foot, as compared with present color costs of 8½ cents a foot and up.

Laboratory work on the process is practically completed. The job now facing the company is that of designing machinery to standardize the quality of prints. Prints used are in black and white. Color is transferred to the screen through the addition of a filter in front of the projector lens. The projector can be operated at normal speed.

Filmo Topics

JUDGING from advance information, the March issue of Filmo Topics, the excellent publication of the Bell & Howell Company, should prove of real interest to all users of 16 mm. equipment. A copy will be mailed free to anyone who sends his request to Bell & Howell Company, 1801 Larchmont Ave., Chicago, Ill. The contents list follows:

Filmo Joins the Army. How motion pictures helped keep Battery "A," 15th Coast Artillery, in the "excellent" class. By Capt. A. C. Cleveland, Coast Artillery Corps, U. S. Army.

Composition in Motion Pictures. Some simple artistic principles which you'll do well to apply whenever you sally forth with your Filmo.

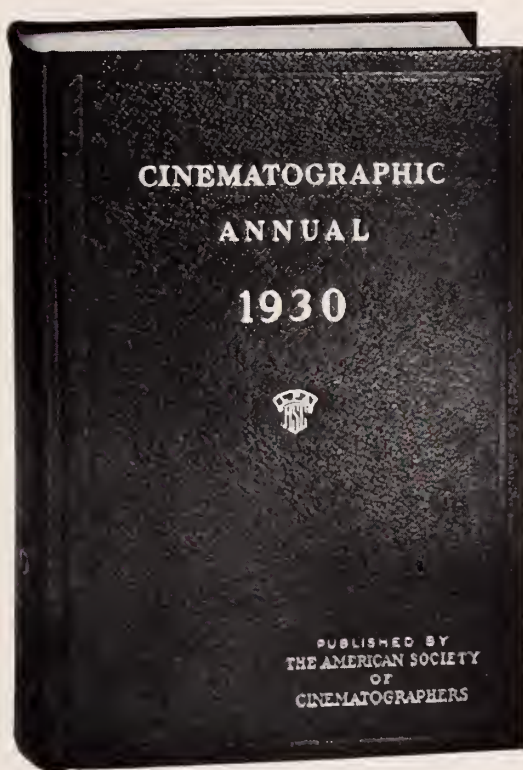
A Naturalist "Goes Filmo" . . . and produces motion pictures of bird life which are employed in Audubon Society educational work.

Filmo News Pictorial. News photo and captions.

Titling Your Films. No. 6. A pot-pourri of novel title ideas used and contributed by Filmo owners.

"Facts About Filmo." Article No. 15, dealing with the optical system of the Filmo Projector. By J. A. Dubray.

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Lacos Light "Cimarron"



AN ASSEMBLAGE of Laco incandescent lighting equipment which represented one of the largest batteries of lights ever to be used, recently was employed by Radio Pictures at the premiere of "Cimarron" at Orpheum theatre.

It was a case of turning the proverbial "night into day," so effective was the lighting. Scores of folks from back east,

eager to glimpse the "stars," had little difficulty from vantage points half a block away in distinguishing one player from another. Chief Electrician William Johnson of Radio Pictures, together with his staff of able technicians, are to be congratulated upon their ability to introduce something effective in modern outdoor illumination.

Tanar Corporation Announces New Portable Double Sound-on-Film Recorder

ANEW portable Double Sound-on-Film Recorder has just been announced by the Tanar Corporation of Hollywood, makers of the Tanar single system portable recorders. Many months of experiment were devoted to this system before Mr. Len H. Roos, vice-president and general manager of the company, gave it his approval. But now, he says, this unit is mechanically perfect.

The new Tanar Portable Double Sound-on-Film Recorder is very light, compact and mounted complete, similar to the battery case in the regular Tanar Portable Single System.

The Double System makes use of the same amplifier and battery supply as the Single System and the recorder itself takes standard Bell & Howell magazines of either four hundred or one thousand feet. Mechanical movement of the recorder is properly dampened and filtered so that perfect mechanical motion is received on the film.

Recording is done on positive stock with the standard Tanar Light, and the slit block is interchangeable with the rails in the camera of the Single System. This means that owners of Tanar Single System may purchase the extra case with the

recorder and control panel, slip the block out of their camera and push it in place in the double recorder which will give them the equivalent of two outfits.

All castings are made of an aluminum alloy which is light and strong and which makes a beautiful machine finish.

The D. C. Interlock Motors which run on three B batteries are built for Tanar by a large motor concern in the East which specializes in fractional horsepower motors. These motors were selected after an exhaustive search on several makes, and it was found that with a standard motor converted to an interlock D. C. system, the armature had a tendency to burn out when one motor had a heavier load than the other. In the new type motor, provision is made for over load with a proper compensator between the interlock connection and all danger of burning out the armature is eliminated.

The recorder mounts the tachometer, speed control footage recorder and is a complete unit in itself. All moving parts run in an oil bath and power is transmitted by worm and wheel, both of these parts being capped and ground to a perfect fit.

Tanar announces immediate delivery on these units and they carry the same guarantee as the Single System.

World's Largest Studio Planned in Great Britain

ERECTION of a studio, intended to be the largest in the world, on a 145 acre site at West Weybridge, is reported planned by a powerful British financial group headed by Lord St. John of Bletsoe. In connection with this gigantic project, for which a sum of \$5,000,000 is said to be available, a hotel, theatre and a factory for the manufacture of phonograph records will be built. Negotiations are understood to be under way between the backers of the proposed studio and film interests in France and Germany for making the studio a center of multi-lingual production.

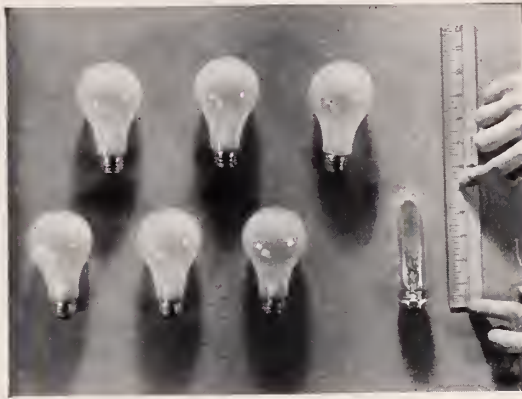
First Australian All-Talker

SYDNEY—After more than six months' in production, Norman Dawn's "Talkie Mad," first Australian all-dialogue picture has been finished.

1,940 Wired in Germany

BERLIN—Latest figures show that there are now 1,940 houses wired for sound in Germany. Of these theatres 752 are equipped with Tobis-Klangfilm, 309 Kinoton, 347 with home-made devices, and 532 for which the systems were not ascertained.

Bell & Howell Announce New Lamp for 16 MM. Projection



THE FIRST 75 volt 375 watt lamp ever perfected for 16 mm. movie projection has just been announced by Bell & Howell. Said to achieve a light intensity more than 40 per cent greater than was previously available for this type of projection, it depends primarily for its unusual results on a tremendous light concentration interestingly exemplified by the accompanying illustration.

In the picture one of these powerful little lamps is placed alongside of six 60 watt electric light bulbs such as are used in the home. When one considers that this new type projector lamp is actually only about one-third as large as one of the 60 watt bulbs and yet furnishes more illumination than all six of the latter combined, he can appreciate something of what has been accomplished.

Repeated scientific tests, made under widely varying conditions, are said to justify the statement that Filmo projectors, when equipped with this new lamp, can easily project black and white pictures 12 feet wide with entirely satisfactory distinctness and can attain excellent Kodacolor projection on a larger than ordinary screen.

The problem presented to the illumination engineers in developing this new lamp was to concentrate the maximum permissible amount of light upon the small 16 mm. film. Not only was it desirable to increase the amount of illumination so as to permit showing a large picture of sufficient brightness, but the light must be concentrated in as small a source as possible to focus properly with the optical train of lenses employed in projection, all of which has been successfully accomplished.

It is stated that naturally the new lamp, because of the great concentration of light, generates a fair amount of heat, but a projector equipped with an efficient fan cooling system satisfactorily takes care of this situation.

This new 375 watt lamp has opened up a tremendous field for the 16 mm. film. The perfectly safe little 16 mm. projector can now go into the auditorium and assembly hall and show pictures of entirely adequate size, clearness, and brilliance. This great step forward will be especially welcomed in the church and educational fields. Home movie projectionists will also appreciate the possibility of securing theatrical brilliance on a larger screen. The notable improvement made possible in Kodacolor projection is not the least of the triumphs scored by this new lamp.

Movietone in British Federation

LONDON—British Movietone News, Ltd., has been elected member of the Federation of British Industries, and is the first newsreel firm to be so honored by this organization.

Novel Lightning Researches by Amateur Photographers

A STUDY of French lightning is being made by amateur photographers organized by the Astronomical Society of France. Already many photographs of lightning flashes have been sent in and studied by the Society's experts. It has been found that these flashes seldom if ever are single, but that there are always a number of back and forth surges of electricity between the earth and the clouds, almost like an electric arc following the path of the first spark where this spark has broken down billions of atoms of the air gases and to make the path more highly conductive for electricity.

This is a conclusion already considered probable by American observers using high-speed motion picture cameras. Another and less well-known conclusion of the French study is that the path of a lightning flash may continue to glow for an appreciable time after the electric flashes have ceased entirely, this glow presumably being caused by the re-combinations of the atoms of air gases decomposed by electricity.

One of the chief needs of further lightning study, it is stated by Dr. Emile Touchet, vice-president of the society, is for additional photographs of lightning flashes by cameras with plates moving at high speed, so that the direction of the flash and the nature of its motion through the air can be determined. Another need is for stereoscopic photographs of the same lightning flash from two or more different points at measured distances apart on the ground, so that the heights and distances of the two ends of the flash can be computed. Members of the society are now being asked to attempt these additional tests.

Dyer Production Manager

EDWIN L. DYER, A.S.C., has been made Production Manager of the Southern Division of the Motion Picture Advertising Service Company, Inc., with his headquarters at New Orleans, La. He writes that natural color photography will play an important part in these films within a short time.

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Dupont Announces New Film

DUPONT has announced a faster panchromatic negative. Its sensitivity to all wave lengths of light has been greatly increased, according to DuPont officials, but the color balance, grain size and latitude are said to remain the same as in the former product.

"There is nothing for the cameraman to familiarize himself with except the adaptation of his lighting to a lower level," states the announcement. "This level varies in actual practice with the desires and artistry of the individual cameraman. From numerous tests which have been completed, excellent results have been obtained with reductions in amperage ranging from 40 to 65 per cent. This means a considerable saving in electric current, but perhaps the greatest advantage will be for the actors, as the glare and heat under which they have had to work can be greatly reduced.

"Manufacturers of panchromatic negative have generally recommended the handling of their product in total darkness or in a very feeble Wratten Series III safelight. Experienced operators will find that such a safelight may still be used with the faster negative, but of course greater precautions are necessary, such as substituting lower wattage lamps in the safelights and reducing the time the film is kept under the safelight. It is recommended that the operator determine under working conditions just how long the negative may be kept under the safelight at each working point without fogging. This can readily be done by exposing small pieces of the negative for different periods of time at the closest point to the safelight at which it is customary to work.

"No changes have been found necessary in desensitizing baths. Those laboratories which practice desensitization before development may continue their usual practices with the faster film without harmful effects upon the photographic quality. Filter factors for the faster film remain approximately the same. DuPont will continue the manufacture of the former negative, so both the high speed product and the regular product are available."

Camera Silencing Plans

AS A FIRST step in the renewed investigation of the problem of silencing the camera, the Producers-Technicians Committee of the Academy of Motion Picture Arts and Sciences is conducting a survey of the experiences and opinions of all first cameramen in Hollywood studios with regard to camera covers (blimps, bags, etc.). In this survey the Committee is receiving the cooperation of officials of Local No. 659 (International Photographers of the Motion Picture Industries), of the I. A. T. S. E. and M. P. M. O. Leaders of the American Society of Cinematographers have also expressed approval of the survey.

The questions call particular attention to the effects of new developments in noiseless recording and directional microphone devices.

This survey is intended to keep the Producers-Technicians Committee abreast of current developments and needs in camera silencing. In 1930 this Subcommittee conducted a thorough survey of the problem followed by scientific noise tests of all varieties of camera covers and of the cameras themselves. It was found that the silencing efficiency of the device varied over a wide range, and that the range in noise from the uncovered camera was a very considerable factor in the problem. The published report of the subcommittee established standards for desired camera silence, listed fundamental requirements and recommended materials for camera covers. It is planned to bring this report up to date after the present investigation.

The Camera Silencing Subcommittee consists of Kenneth F. Morgan, Frederick M. Sammis, and Lester Cowan, Manager of the Academy Technical Bureau.

24" Integral Inkie



Integral Inkie Tests

ACCORDING to Elmer Richardson, of Mole-Richardson, Incorporated, interesting tests were recently made with their new product, the Integral Inkie. In one instance they selected a 24-inch integral sun spot, switched the current on and off twenty-five thousand times without interruption. This it is stated, is equivalent to five years of severe service.

According to Mr. Richardson, every Mole-Richardson product is exhaustively tested to bring forth possible hidden flaws before being placed on the market.

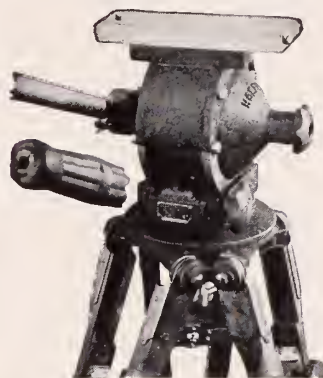
Concerning the new eighteen to twenty-four inch Integral Inkie sun spots, Mr. Richardson states that lamps of this type are particularly adapted to back and top lighting or where modeling is employed, for close-up photography. They are also used for front lighting where sets are deep or extremely large. Where special intense light is required, or it is necessary to effect lighting through windows and doors, the new Integral Inkies are adaptable. Further use is for sky illumination or bally-hoo lighting for night advertising purposes.

Special features of this new Integral Inkie, according to Mole-Richardson technicians, are its Integral construction which does not permit cracking or popping noises when the lamps are turned on and off; its lightness in weight which is due to the fact that the head is cast from silicon aluminum alloys; the simplicity of its design and its exceptionally low up-keep. Also it is stated that the new Integral Inkie affords more light or ejects more light due to a special mirror.

Integral Inkies are now being manufactured in eighteen and twenty-four inch sizes. However, it is stated that the new lamp will be manufactured in all regular sizes.

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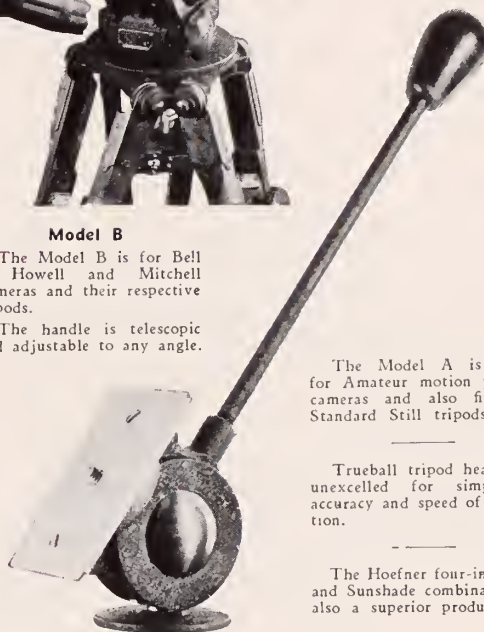


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The Model B is for Bell & Howell and Mitchell Cameras and their respective tripods.

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attention

The pictorial section of the next volume of the Cinematographic Annual is being compiled. Anyone wishing to contribute prints for this section may send them in now for consideration.



Excellent Warning

AT A RECENT meeting of the Executive Committee of the Academy of Motion Picture Arts & Sciences it was decided that some effort should be made to stop the influx of young men and women who come to Hollywood for the purpose of entering motion pictures. A false impression has been spread over the country that golden opportunities lie within the grasp of any fairly talented or reasonably good looking young person who can manage to get to this city.

"The fact is," say Academy officials, "that there is a crying need for a reduction in the number of actors and actresses already here; players of training and ability who are literally in dire want and for whom there is no work.

"Of the seventeen thousand five hundred (17,500) extras registered at the Central Casting Bureau during 1930, only eight hundred thirty-three (833) averaged one day's work per week and only ninety-five (95) worked as much as three days per week. Of the seven thousand (7,000) actors and actresses registered in the Call Bureau only six or seven were placed each day. If work could be equally distributed this would mean each actor of the Call Bureau could be furnished one part every three years.

"When the industry is so hard put to it to care for its own tried and experienced players it is sheer suicide for youngsters to try to break in. It would help the situation if the press of the country would aid in spreading a picture of true conditions in the profession. Too much emphasis has been placed on the fortunate few who are in great demand and too little on the many thousands of experienced players who cannot make both ends meet.

"Less than a thousand actors are doing most of the work. A youngster, to get a chance, must pass the other six thousand (6,000) professional and registered actors, and in addition must compete with the thousands of young men and young women all over America and even in foreign countries who have the ambition for a motion picture career. The lucky break happens frequently in fiction; almost never in the Studio. To the average casting director it looks as if the audience all wanted to be actors and the actors were forced to be audience. Something must be done to impress the young people of the country with the fact that we do not need them in Hollywood. The oversupply of applicants for positions in the motion picture profession exists in all departments of production and the situation is relatively acute."

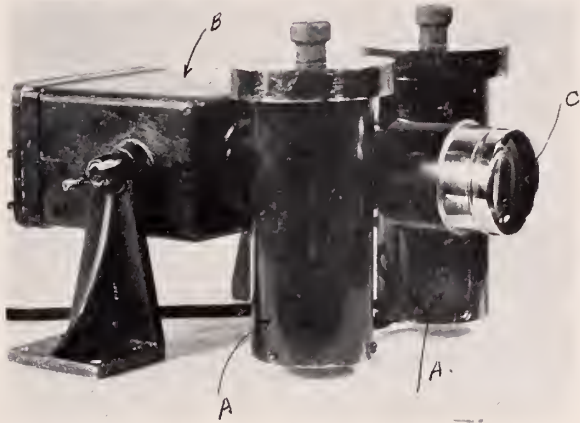
Victor Issues Supplement

DUE to the unprecedented rapidity of development of the non-theatrical "Talkie" market during recent weeks, the Victor Animatograph Company has found it necessary to print a supplement to their very excellent Directory of Film Sources which they issued a short time ago. This supplement contains all the names of sources of 16 mm. films with sound-on-disc that the company has been able to compile to date. It also lists the titles of a great many of the available films, and should prove of worth to anyone interested in non-theatrical talkies. The supplement will be sent on request, free, to anyone writing the Victor Animatograph Corporation, Davenport, Iowa.

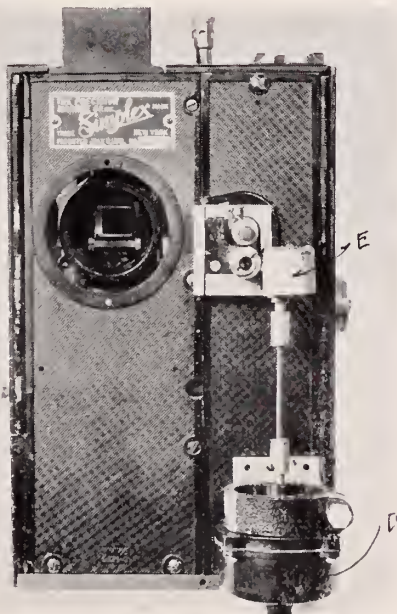
Radio Studios Buy Lamps

ONE of the largest orders for lamps reported in Hollywood for some time has just been filled by the Lakin Corporation for Radio Pictures Studios. A total of 107 24-inch Laco Lites was the order. Delivery was made last month. This is in line with the general signs of increased activity seen at the Radio Studios.

Useful Device



M. W. PALMER of the Paramount Studio, Long Island, N. Y., has developed a unique device for projecting footage numbers. It is shown in the two pictures accompanying this brief description. The device, according to Mr. Palmer, can be used in various ways in connection with sound pictures, as for instance: the introduction of sound effects in scenes already taken, the footage numbers appearing on the screen give an advance warning of the approach and finish of the scene in question, so that the sound can be synchronized exactly. Another application is the translation of the film from one language to another, and it can also be used in connection with title music.



Box "B" contains an electrical operated Veeder counter. The face of this counter is illuminated by two 10 Watt lamps contained in the lamp houses "A." The image of the counter numbers is thrown on a small screen below the main screen by the lens "C." A contactor "D" attached to the projector is driven by a worm gear "E." This contactor makes one contact for every 16 frames, thereby moving the counter ahead one unit.

The only alteration necessary to the projector is to bore four holes to attach the base of the contactor. A push button is provided in the operating room, so that the counter can be reset to zero at any time.

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The German Selection

OF INTEREST to Americans is the poll of the ten best pictures of the year, just completed and announced by Der Deutsche, Berlin daily. The poll of this paper differs considerably from that of Film Daily's poll, in that while it was a German paper that handled it, American films were selected. The poll of Film Daily showed not a foreign picture, although there were some excellent ones. The two groups follow:

Der Deutsche

1. Under den Dachern von Paris.
2. All Quiet on the Western Front.
3. The Blue Angel.
4. Westfront 1918.
5. Anna Christie.
6. Two Hearts in Waltz Time.
7. With Byrd at the South Pole.
8. Brand in der Oper.
9. The Big House.
10. Mickey Mouse.

Film Daily

1. All Quiet on the Western Front.
2. Abraham Lincoln.
3. Holiday.
4. Journey's End.
5. Anna Christie.
6. The Big House.
7. With Byrd at the South Pole.
8. The Divorcee.
9. Hell's Angels.
10. Old English.

7 Soviet Features Set On New Season Schedule

SEVEN features are reported definitely set on the Soviet schedule for 1931, with "Life is Beautiful," a Meschrabpom production already completed. Others on the program include the Sovkino vehicles, "The Road Through Life," "The Iron Transport," and "Towns and Years." "Igdenbu, the Great Hunter," a Siberian mountain story, "Don Diego," and "The Five Pioneers," said to be a second "Turksib" but showing the construction of a huge canal instead of a railway, round out the lineup to date.

Pudovkin, director of "Life is Beautiful," is now in Berlin arranging for the German premiere of the film to occur this month.

3 New Color Processes Introduced in Europe

THREE new processes for color photography have been introduced in Europe within recent weeks, it is reported in dispatches to the M. P. Division of the Department of Commerce. In Paris the Societe Continentale Europeenne Cinecolor has been formed with a capital of 3,500,000 francs to exploit the Thornton process, the patent of which is held by John Edward Thornton, of Jersey, England. Louis Aubert is on the company's board of directors. Another French company, Societe Cinechrome, with a capital of 55,000 francs, will exploit a color invention produced by Raphael Weill and Eugene Rivoche. In Germany the Arena Co., capitalized at 300,000 marks, is to manufacture a color film under a new and inexpensive system known as spectrocolor.

FOREIGN NOTES

\$5,000,000 British Firm May Operate at Elstree

LONDON—Celloda Syndicate, Ltd., it is reported, is planning the investment of approximately \$5,000,000 in a laboratory venture at Elstree, for the manufacture of a newly patented non-inflammable film-stock to be marketed at a competitive price. The laboratory, construction of which alone will cost \$1,500,000, will have a capacity of 4,000,000 feet of film per week. The company is also reported contemplating erection of modern studios, which will absorb part of the plant's film output.

Hungary

ON THE occasion of the ten year jubilee of the Hungarian censorship the latter has published a collection of its decisions concerning film prohibitions during this period. It appears from this statistic that during the period in question 15,357 films were censored in Hungary, of which 731, or about 5 per cent of the total submitted, were banned. It must be remembered, however, that about 2/3 of the films submitted to censorship were newsreels, farces, educational, publicity films, etc., while only 1/3 were feature films. Yet, the 731 pictures banned were almost exclusively features. The percentage of banned films, therefore, amounts to about 15 or 20 per cent of the total submitted.

Argentine Tariff Asked

A DELEGATION representing Argentine film producing interests recently petitioned President Uriburu for tariff or other protection for the national film industry. Argentina produced last year five moving pictures. Releases from all sources amounted to 800, most of which came from the United States, Germany, France, Spain, Italy and England contributed some films.

Third Dimension

A FURTHER claim to have solved the problem of stereoscopy has now been made by Continsouza, the French projector manufacturer, now part of the Gaumont concern. Nevertheless, in its present stage the invention is only effective with one spectator. A film made on this new principle was shown in natural colors and projected through a new type of apparatus. Continsouza claims that it will be able to put the perfect three dimensional projector on the market in the near future.

Berlin

A NEW Chamber (No. 4) was instituted at the Berlin Court, beginning January 1, 1931, the competence of which involves litigations among artistic and musical employees (in theatre and film), film operators, cameramen, sound-operators, etc. The Chamber will also control the execution of the decisions of the special vaudeville and stage arbitration court, and receive appeals against these decisions. In view of the great number of cases submitted, the "Stage and Film Chamber" will have two presidents and meet five times a week. These presidents will be Messrs. Franke and Hildebrandt, who for years have been specializing on film questions.

France

The French Exhibitors' Syndicate is organizing a month's visit to study cinema exploitation in the United States. The party headed by the president, Leon Brazillon, will leave Paris on March 15, next, and will visit New York, Philadelphia, Chicago, Boston, Dayton, Detroit, Buffalo, Washington, San Francisco, and Hollywood. A trip to Niagara will be included.

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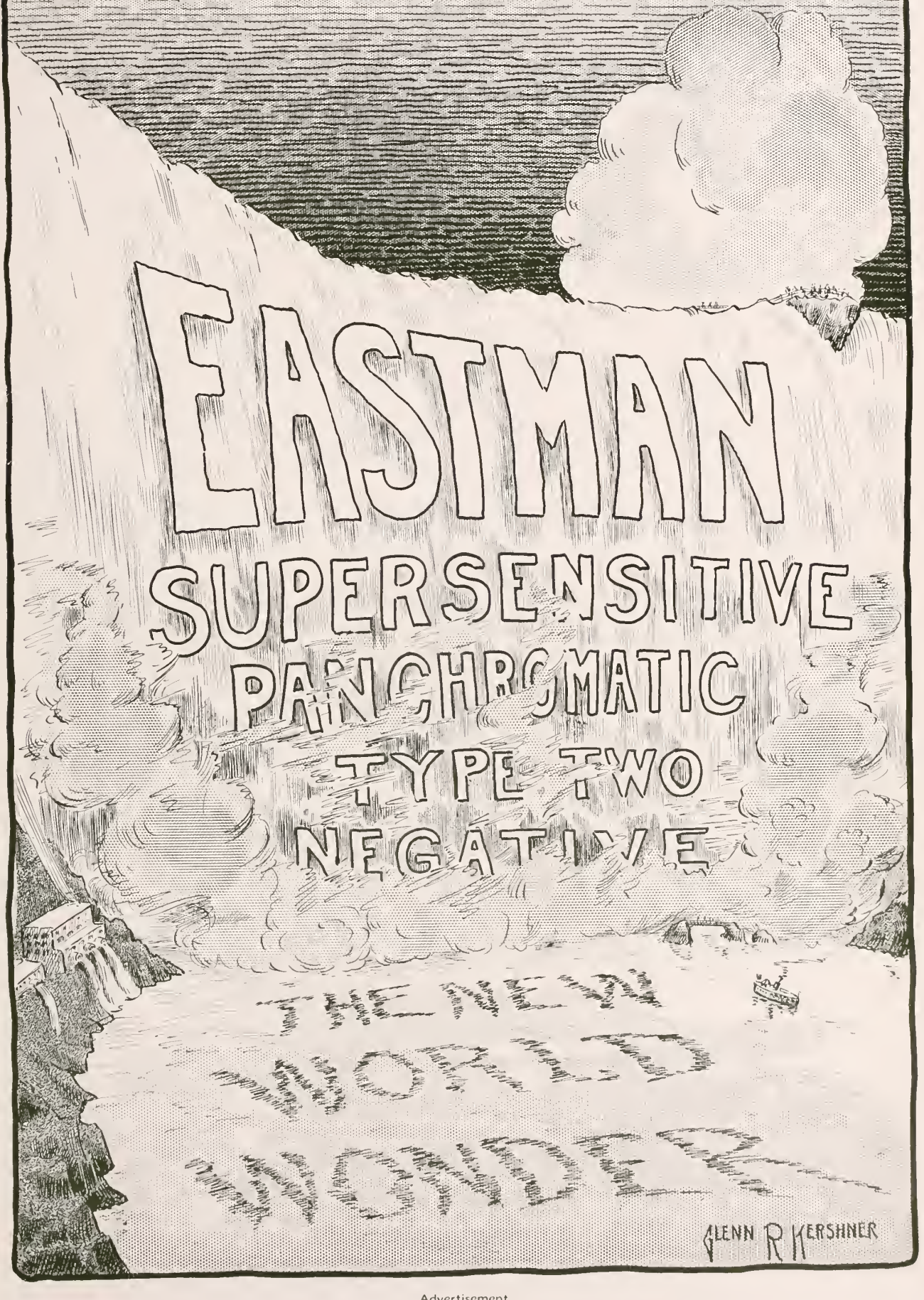
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DOWN OUT OF THE WAY - WHY -
"BILL" BEAUDINE - SAID IT WAS
THE FIRST TIME HE EVER GOT
UP CLOSE TO THE VIEW FINDER
AND CAMERA WITHOUT GETTING
THE HANDLE ALL TANGLED UP IN
HIS VEST OR NECKTIE AND BESIDES
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I CAN UNLOAD AND LOAD THE
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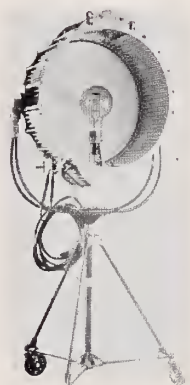
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CApitol 14118



The Big Room of the Carlsbad Caverns. This unusually fine photo was made by Mr. Tappenbeck.



Here we see Mr. Dyer at the camera in the Queen's Room.

Photographing the Carlsbad Caverns

With Incandescent Lights and Eastman Super-Sensitive Panchromatic Film

by **ELMER G. DYER, A. S. C.**, and **HATTO TAPPENBECK, A. S. C.**

THE GUADALUPE Mountains in the South-East of New Mexico with their desertlike aspect and growth contain vast subterranean caves, the Carlsbad Caverns.

At the height of 4400 feet above sea level the road leads to the natural entrance of the cave, part of which has been exploited for over two decades past for its valuable deposits of bat guano. However, the scenic wonders of the Carlsbad Caverns became accessible to the public only in recent years, especially since the National Geographic Society explored them scientifically in 1924.

After taking the regular tourist trip in order to ascertain the possibilities of photographing the interior of the caverns and to get our bearings on the feasibility of making an educational subject out of it, we—Elmer G. Dyer, A. S. C., Len Galezio, and Hatto Tappenbeck, A. S. C.—packed our heavy equipment in "packs" down the easy footpaths and broad stairways. These are fully lit from the indirect electric floodlights, which are used for illuminating the dripstone formations. Perry T. Convis, our guide and electrician, who showed an excellent knowledge of the photographic qualities of the cave, lead the way down to the 750 foot level, the starting point of our operations.

Right here began our difficulties. Everything seemed unfamiliar from what we had seen on our first inspection trip. Where ever we looked the formations were strangely similar and at the same time vastly different in detail. Every angle invited the camera. The aspect was indeed bewildering and confusing; such a variety of beautiful formations surrounded us. We chose our first set-up. Then came the huge task of photographing it.

The cave is illuminated in sections through floodlights of 100 to 2000 watts. The building and drilling of the new elevator shaft of nearly 800 feet required a considerable amount of the power available. For that reason we had to confine our lighting to the natural illumination of the cave formations with an occasional addition of a few 500 watt nitrogen lamps which we carried with us. The maximum light we used did not exceed 8000 watts at any time.

The use of flares is prohibited. Past experiences with them showed that they blackened the formations considerably, and that it took hours and often days before the black smoke cleared away entirely out of the cave. That we were compelled to light our subject with incandescents only accounts for the excellent photographic roundness which we obtained, compared with the more or less contrasty and flat results of previous photographic attempts. Still photographs have required up to 4 or 5 minutes exposure with the present lighting.

You can picture the difficulties we had to overcome with the present rate of camera speed of 24 and the necessity of a character in nearly each scene. To express the size of the underground rooms and formations without showing a person for comparison is impossible, and to convey their size truthfully to the condensed space available on the screen has thus far defied all efforts. There is no doubt that the accomplished result is of high teaching and educational value, but as far as realizing the immensity and the beauty of the Carlsbad Cavern, it seems to be only a feeble attempt. It may be best likened to the Grand Canyon which has never been photographed yet to a faith that does it justice.

Our camera equipment consisted of a standard Akeley camera with a 230° shutter and motor. The fastest lenses made from 35 millimeters up to 12 inches were at our disposal. In addition to that we used the fastest commercial film made up to date, the new Eastman supersensitive panchromatic film, which gave us such a splendid recording, that, without exaggeration, we have obtained the best picture ever made of the caverns, considering the small amount of light we used. Only to record the extreme close-ups of the formations we used the Eastman Type 2 panchromatic film. This proved to be an excellent stock for that purpose and helped considerably to save our limited supply of the supersensitive film for the longer shots.

Not knowing the possibilities and limitations of the new supersensitive stock, we resorted to the testbox. The first tests we made were very discouraging. This was found to be mainly due to the rapid temperature drop of the developer which was especially prepared for this Eastman supersensitive film. The temperature inside of the cavern remains constant at 56° F during the entire year, day and night. The temperature change of the developer was overcome by heating it in front of the strong incandescents and keeping the testbox itself warm by means of a smaller electric bulb inside of it, when not in use. During the night, however, the developer, hypo, water, and everything else dropped again to the constant temperature of the cave.

In photographing the different formations of stalactites, stalagmites, coralline encrustations, popcorn and spaghetti-like growths, bunches of grapes, lily pads, etc. we encountered such unexpected results in regard to light-value, that a test before every shot was a necessity. The time we lost in testing proved to be well spent, since our efforts would have been futile without the tests to judge by. The photographic exposure meters which we used so successfully above the ground and on sets did not show any registration due to the great absorption of the light by the porous formation. Turning on a few incandescent lights was like striking a match on Broadway. The weird and infrequent illumination of the cave defied any accurate guess of distance and therefore light value.

We noticed in screening of the film that it is impossible to register depth in the proper way. It seemed to fade away in the distance. Smaller rooms and small objects recorded much more in their true proportion on the screen. This appeared to be due to an optical illusion which in connection with the unusual light effects exaggerated the small objects in the foreground and reduced the far ones, many times as large, to mere miniatures.

No two formations in the huge rooms are alike, no two absorb or reflect the light in the same way. Occasionally one can detect a bit of color. A closer examination under a powerful flashlight reveals, on the contrary, a wealth of color; chalk white, cream yellow, and a sparkling frost of the stalactites is found near the pink and rose tinted curtains and draperies, while the basic rocks show black, gray, and brick-red in addition to the jade-green of the flowstone, the light cream coloring of the great stalagmite domes, and the turquoise blue of the pools of crystal clear water. What a subject for color photography!

The minerals of which these formations are built up, gypsum, lime, and sodium carbonate have their characteristic tints,



The Giant Draperies—photo by Mr. Dyer

which may be observed all the way from the entrance down to the lowest levels. Water which once deposited its minerals in the "Auditorium" and formed there the "Speakers Pulpit," etc. has seeped 7-800 feet down and does its work over again, creating the same eerie shapes and formations so characteristic of its chemical contents.

On the 750 foot level, the only one thus far accessible to the public, are three enormous rooms and numerous smaller ones. The "Queen's Chamber," the smallest of the three, 160 feet in length and 140 feet wide, is noted for its "Elephant's Ear," water pools with lily pads, lace draperies, and other fine examples of nature's creative art.

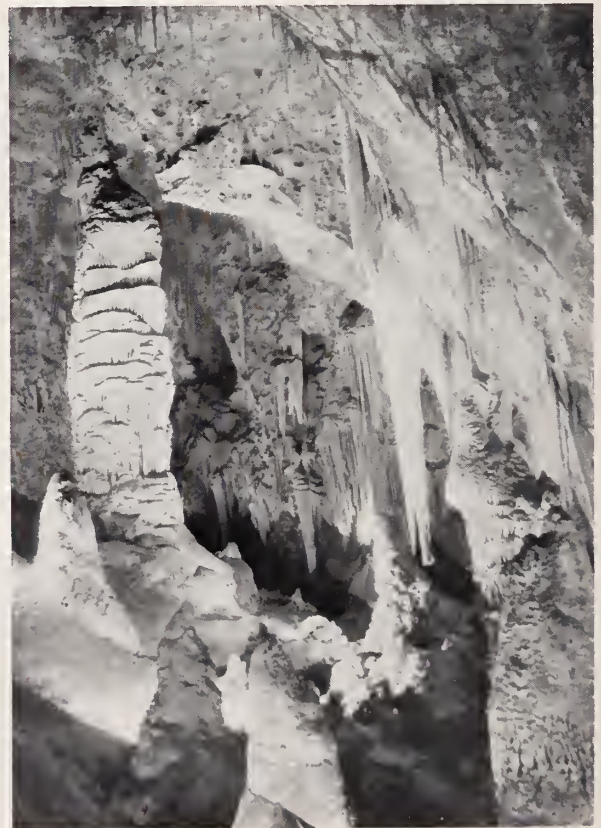
Next in size is the "King's Palace," a room of gigantic dimensions with many nooks and niches. Thousands of stalactites hang from the ceiling, and gleaming onyx folds form transparent curtains of infinite beauty. In one corner of the room the stalactites nearly reach the ground closely resembling the pipes of an organ. Indeed, a tune may be played on them by tapping the different stalactites, each of which resounds in its own clear and colorful tone, not unlike the chimes of an ancient clock.

The "Big Room" is appropriately named. It is over $\frac{3}{4}$ of a mile long. Its maximum width is 625 feet, while its ceiling rises up to 300 feet. The Capitol in Washington could be placed into it and there would still be space left for other buildings besides! At first the task of lighting and photographing this room so as to do it justice and to show its gigantic dimensions appeared to be impossible. Many tests were made, the few lights were changed time and again so as to use them to the best advantage, and the camera was placed to shoot the Big Room to its greatest extent. By the end of the day we had the satisfaction of having photographed what might perhaps be called the largest "Interior" with a minimum of light. The next day we went into the details of the room. The various formations lent themselves to artistic composition and lighting effects from almost every angle. Which one of the three or four set-ups to choose was always hard to decide. Each one presented such a beautiful picture that it was a stand-off to the others.

One of the first shots we made was that of a waterfall, coming out of the ceiling and falling down over several ledges to

the bottom of the cave. It reminded us of a frozen tree with many branches of ice and snow, which glistened in the light of the incandescents. On the screen finally it was a disappointment. It turned out to be a neutral gray, which may be explained that certain underlying minerals were seen by the eye, but did not register on the otherwise sensitive emulsion of the film. If this formation had been alive still, the result would have been different. The greatest art of the Big Room is now inactive. That made this location perhaps the hardest we ever worked on in the real sense of the word. Most of our camera set-ups were off the beaten paths, which had been covered with a clay or dirt like substance out of some pits in the cave. This was done to keep the dust down and to make the walking easy for the tourists. By the second day our boots showed signs of weakness and on the fifth they were worn through and we walked on our socks. To fall down or slip with the camera or other equipment resulted in severe abrasions to clothes and hands on the rasplike formations of lime, gypsum, and sodium carbonate. The latter could be found in blocks or powder form all over the cave. Our developer called for it, and there was enough of it right here to supply the demand for all the developers in the next hundred years. Once on setting the lights and climbing over the uneven ground in the semi-darkness Len Galezio lost his foothold on the loose rock and started sliding towards a large opening in the ground. "Keep away from there," the guide called, "that is the 'Bottomless Pit.'" Nobody has been able to ascertain its actual depth yet, though one person has been let down in it for 300 feet." On another occasion in order to get a good photographic angle we climbed fifty feet down with the camera in one hand, the other holding onto the wobbly rope ladder, which was left there by a previous expedition.

The Twin Domes are undoubtedly the greatest attraction of the Big Room. They may be seen from every angle. Nearly in the center these giant specimens of stalagmites, light cream and yellow in color, stretch their heads—60-70 feet high



Giant Dome and Draperies—photo by Mr. Tappenbeck

towards the ceiling. Their diameter at the base exceeds 16 feet. Strangely enough, the little hill which forms their pedestal is of dark gray, nearly black color. Imagine the time it took to build these twins up with the slowly dripping water depositing its carbonate of calcium at the rate of one cubic inch per hundred years! The Twin Domes were comparatively easy to light and to photograph as they stand free and are quite accessible. On the sides of them huge stalactite draperies hang sixty or more feet down from the ceiling creating the impression as if it all was meant by nature to be a stage setting. The remarkable transparency of these pure onyx curtains is easily demonstrated with a few incandescents placed behind them. They photographed with surprising fidelity.

Imagination plays a great part in these caves. The strangely shaped formations convey in many instances the forms of animals to our mind. Some of the likenesses are so striking that they have received their names accordingly, such as the "Baby Hippo," the "Billing Doves," etc. The latter, two stalactites hanging from the ceiling on opposite sides of a smaller passage-way, have grown together and resemble closely a pair of doves. They are so delicately modeled that they seem to float across the room towards each other.

The most exquisite creations of the whole cave are undoubtedly to be found in that part of the Big Room called the "Crystal Chamber." The formations there are very active. Water is constantly dripping from hundreds of stalactites. The moisture gives them great transparency of a yellow waxy color. This is of high photographic value under the yellow rays of the incandescents, because the sensitiveness of the new panchromatic film has been greatly increased in the yellow band of the spectrum.

Not more than 1000 to 2000 watts were required to photograph any part of this room. Here we had to make our tests in order not to overexpose. Often we switched our section of



"Elephant's Ear" in Queen's Chamber—photo by Mr. Dyer

the cave lights off and thus made a natural dark room out of the cave itself. No testbox or changingbag were then required. As soon as we stopped moving around the moisture in the air made us chilly. Otherwise the coolness of the cave was very pleasing and refreshing. However, every night we took our exposed and unexposed film with us out of the cave, to avoid getting it damp and to prevent the dust from the sodium carbonate or lime to seep into the magazines and make chemical stains on the film.

Graceful draperies, exquisite lace embroidery covered the walls of this masterpiece of nature's handiwork. The dripping water collected in turquoise pools of clear drinking water, through which the formations showed so distinctly down to the bottom, as if there had been no water at all. We threw little stones in it to register the water in the film, creating the impression of drops falling from the stalactites above. Banks of a thin, ice-like crust of minerals stretched partly over the pools. Those were strong enough to hold our weight, at the same time transparent as a ground glass to the incandescent lights.

Six days we spent transferring these wonders to the film. If we had attempted to photograph the entire cave it would have taken us over three months. We could go on filming indefinitely and still have found new subjects, new combinations of lighting effects and composition, even if we exposed enough film to make another "Hell's Angels."

Every morning we descended a mile and a half into the earth. Every day we made new discoveries. We never got tired of looking at the beauty in the cave; in fact, the more we saw of it, the more understanding and appreciation came to us. On our daily trip to the surface we noticed in the far end of the "Auditorium" a beautiful sunset with overhanging clouds, painted in gorgeous colors by the light and shadow effect on the rear wall like a back drop of a stage setting.

Then climbing towards the cave entrance, still hundreds of feet below the top we got another thrill, seeing the faint blueish-green rays of daylight suddenly burst into a beam of gold with the blue sky and the racing white clouds above. And there among them was Old Glory gracefully waving in the evening breeze.



Mr. Dyer seated among "Lily Pads"

The Depth of Field of Camera Lenses

With Special Reference to Wide Film

by **ARTHUR C. HARDY**

Massachusetts Institute of Technology

BY THE very nature of optical imagery, a lens is capable of forming a sharp image of only a single plane of the object space. In practice, however, such factors as the aberrations of the lens or the graininess of the film establish a limit for the useful sharpness, so there is a certain "depth of field" that may be said to be in sharp focus. The depth of field is sometimes called the depth of focus, but the latter term has a different significance in optical terminology.

The lack of depth of field of a lens is familiar to anyone who has ever attempted to make photographs with lenses of high relative aperture, but there is nevertheless a great deal of misinformation on this subject. This seems to be a consequence of the custom of judging the depth of field from the results of photographic tests, which are seldom conducted in such a manner as to yield results that are really significant. Even if they are, a lens of poor quality has apparently a greater depth of field than a well-corrected one, and the experimental method of determining the depth of field may therefore be very misleading. It is possible to treat this subject theoretically and, as it happens, the rigorous treatment is less complicated than the approximation that is sometimes made.

This subject is particularly timely because of the current discussion concerning wide film. The effect on the depth of field, when photographing a subject on a wider film, is not immediately apparent. Nor is it apparent that the depth of field may be altered by making a large negative and printing by optical reduction on standard film. The purpose of this paper is to consider these questions in some detail, but before this can be done, a certain amount of optical theory must be developed.

Theory

The depth of field of any lens or optical system is given rigorously by the two expressions

$$d_1 = \frac{rP}{mp - r} \quad (1)$$

and

$$d_2 = \frac{rP}{mp + r} \quad (2)$$

where d_1 represents the depth of field on the far side of the object-plane in sharp focus and d_2 represents the depth of field on the near side. The total depth of field then is

$$d = d_1 + d_2.$$

In the above equations, r represents the radius of the permissible circle of confusion, P is the distance from the entrance-pupil of the lens to the object-plane on which the camera is focused, m is the magnification of an object in this plane on the film, and p is the radius of the entrance-pupil of the lens.

An erroneous estimate of the depth of field of a lens is sometimes made on the basis of the so-called "hyperfocal distance." This is the minimum distance of an object-plane on which the lens can be focused and still have objects at infinity appear sharp. In other words, for this condition, the far depth d_1 is infinite. From equation (1), it follows that this condition will obtain when

$$mp - r = 0. \quad (3)$$

Now, in the Newtonian form of the lens equation,

$$m = \frac{f}{x},$$

where x is the distance of the object-plane in sharp focus from the first focal point of the lens. On substituting for m in equation (3), we have

$$x = \frac{fp}{r}, \quad (4)$$

where x is the hyperfocal distance measured from the first focal point of the lens. Equation (4) can be written in terms of the f/number of the lens, since this quantity is the ratio of the focal length to the diameter of the entrance-pupil. On substituting, we have

$$x = \frac{f^2 \cdot f/\text{number}}{2r}. \quad (5)$$

When equation (3) is satisfied, equation (2) shows that the near depth

$$d_2 = \frac{p}{2}. \quad (6)$$

Hence, when a lens is focused on the hyperfocal distance given by equation (5), all objects are in sharp focus from infinity to a point half-way between the object-plane in sharp focus and the entrance-pupil of the lens.

Now, a short hyperfocal distance indicates a great depth of field when the camera is focused on the hyperfocal distance. It is sometimes concluded from equation (5), therefore, that the depth of field of a lens varies inversely as the f/number and inversely as the square of the focal length. This argument takes no account of the fact that the size of the image varies with the focal length, and that a smaller circle of confusion is required for comparable quality in a small picture than in a large one. Furthermore, the lack of depth of field is seldom troublesome when the camera is focused on an object at the hyperfocal distance, but rather when it is focused on a nearby object. Under the latter conditions, the quantity r in the denominator of equations (1) and (2) becomes negligible compared with the quantity mp . Hence equations (1) and (2) become simply

$$d_1 = \frac{rP}{mp} \quad (7)$$

and

$$d_2 = \frac{rP}{mp} \quad (8)$$

and the total depth of field is

$$d = d_1 + d_2 = \frac{2rP}{mp} \quad (9)$$

The ratio p/p in the above equation can be transferred to corresponding quantities in the image-space by means of the well-known relationship in optical theory that

$$m = \frac{pp'}{p'p}$$

where p' is the distance of the film from the exit-pupil of the lens and p is the radius of the exit-pupil. Equation (9) may then be re-written as follows:

$$d = d_1 + d_2 = \frac{2rp'}{m^2p'} \tag{10}$$

Now, any comparison of the depth of field of two lenses must be made on a basis that insures the same exposure in both cases, since manifestly any desired depth can be obtained by reducing the lens aperture. It is a well-known fact that the amount of illumination on the film in the image of an extended object is determined by the ratio p'/p .¹ Assuming a constant value for this ratio, the depth of field is seen from equation (10) to vary directly with the permissible size of the circle of confusion r and inversely as the square of the magnification. This result is independent of the particular form of the lens. In other words, any claim that one lens has a greater depth of field than another is absurd. If experimental tests seem to indicate a difference between lenses, either the two lenses were not used at the same effective aperture and magnification, or the image quality of one is inferior to that of the other and its depth only appears to be greater.

The lack of depth of field is apparent to the motion picture audience when the size of the circle of confusion on the screen exceeds a certain limiting value. Let us designate by R the radius of the largest permissible circle of confusion on the screen. Then

$$R = rm_p m_s,$$

where m_p is the magnification between the negative and positive in printing (in contact printing this quantity is 1) and m_s is the magnification of the film on the screen in projection. Substituting for r in equation (10), we have

$$d = \frac{2R}{m^2 m_p m_s} \cdot \frac{p'}{p'} \tag{11}$$

Let us assume now an object or actor of height h in the plane on which the camera is focused. The corresponding height of the image on the screen is

$$H = h m_p m_s. \tag{12}$$

Let us designate the over-all magnification between the object and its screen image by M , where

$$M = \frac{H}{h} = m_p m_s. \tag{13}$$

With this substitution, equation (11) becomes

$$d = \frac{2R}{mM} \cdot \frac{p'}{p'} \tag{14}$$

We see, therefore, that for a fixed value of R and p'/p , the depth of field, as seen by the audience, varies inversely as the original magnification in the camera and the over-all magnification M . In other words, it is just twice as hard to obtain sufficient depth when the actor's head is to be ten feet high on the screen as when it is only five feet high. The advantage of making m small will be dealt with presently.

Application to Practice

Let us consider the case of standard 35 mm. practice where both the negative and positive film are of this width and the printing is done by contact. Equation (14) shows that, for a fixed over-all magnification M , there is a definite gain in making the magnification m , in taking, as small as possible. This implies either using camera lenses of short focal length or placing the camera at a great distance from the actors. For the same over-all magnification M , equation (13) shows that m_s must be increased in proportion to the decrease in m .

In other words, the greatest depth of field is seen to result by making the original negative with as low a magnification as possible and relying on subsequent enlargement to provide the required over-all magnification. The limit to the subsequent enlargement is set by the graininess of the negative material. Unfortunately, this limit has been reached with 35 mm. negative film, as the magnification in the projector is already so high that any further increase makes the graininess decidedly objectionable. We must conclude, therefore, that the depth of field for a given effective lens aperture p'/p is about as great as it can ever be made with 35 mm. film unless the graininess of the film can be reduced enough to permit greater magnification in projection.

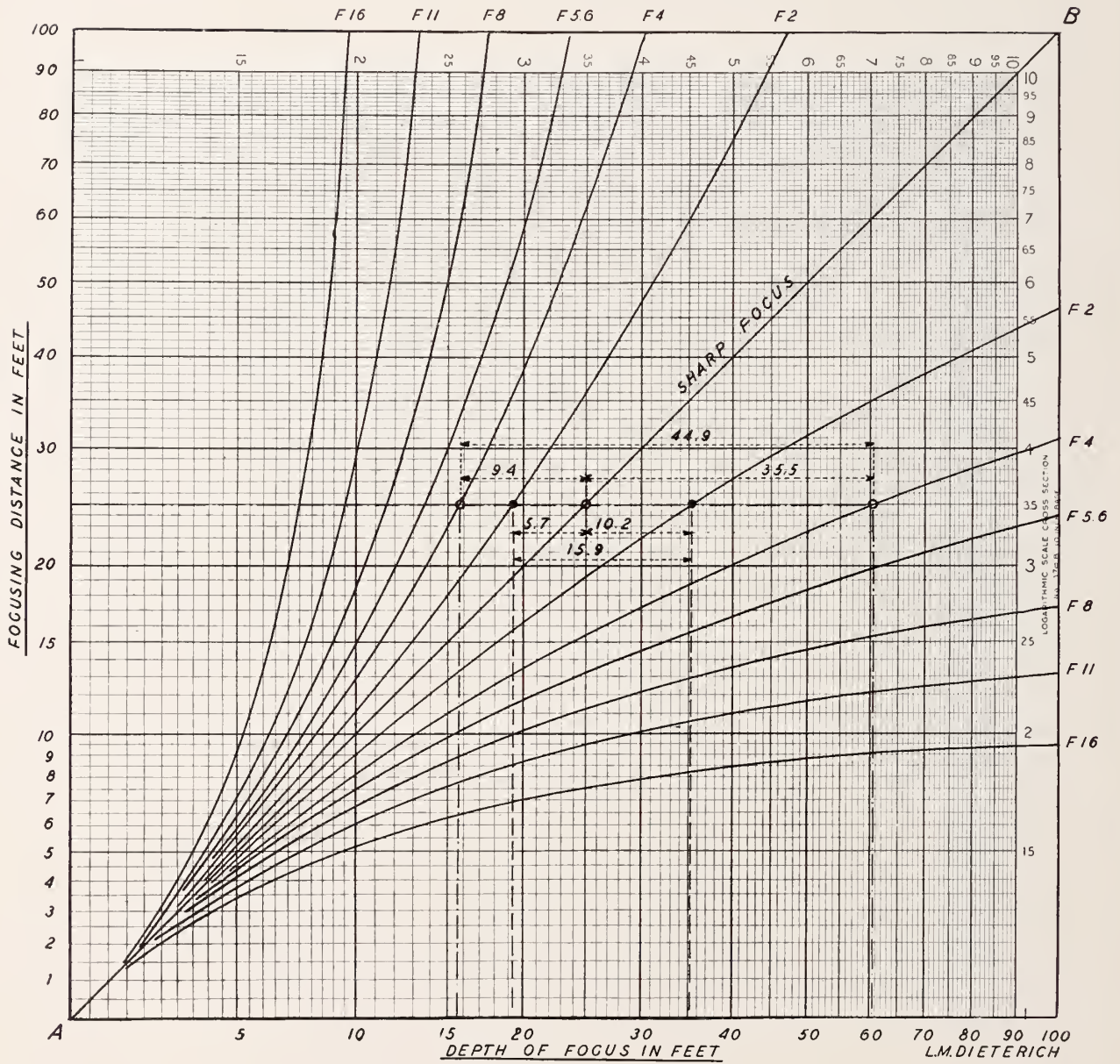
Let us now consider the effect of making the original negative and release prints on a wider film. For the sake of convenience, let us assume the film to be 70 mm. in width, or twice as wide as the 35 mm. standard. There are several possible ways of utilizing this increased width, but most producers seem to regard the wider film as an opportunity to include more action on a larger screen, the size of images on the screen remaining approximately as at present. If this plan is followed, it is obvious from equation (14) that the depth of field with wide film, at the same over-all magnification M and the same magnification in projection, is identical with that obtained in 35 mm. practice. This implies the use of camera and projector lenses of the same focal length as at present. If, on the other hand, larger images are projected on the larger screen, the increased over-all magnification M can be obtained only by increasing either m or m_s . It is impossible to increase m_s without increasing the appearance of graininess. Hence, any increase in M must be the result of increasing m , and equation (14) shows this procedure will decrease the depth of field. This is not exactly true, because a somewhat larger circle of confusion can be tolerated with a larger screen. Nevertheless, the fact remains that larger images on the screen are obtainable only by sacrificing depth of field.

Consider now the case where the negative is 70 mm. in width and the release prints are 35 mm. in width, the printing being done by optical reduction. Since the quantity m_p in equations (12) and (13) does not appear in equation (14), it follows that this reduction process neither increases nor decreases the depth of field when the other conditions are met—that is, when the same magnification m is used in the camera and a final image of the same size is projected on the screen. Equation (13) shows that when m_p is one-half, as it is approximately under these conditions, the magnification in projection m_s must be twice as great to keep the over-all magnification M the same. It is claimed, with some justice, that this reduction process reduces the graininess and that the magnification in projection m_s can therefore be increased over what is possible when the print is made by contact. If the reduction in graininess is one-half, so that the magnification in projection can be doubled, the depth of field of pictures produced in this way is the same as with the two methods that have been discussed previously. It may be remarked in passing that it is no more difficult to design a projection lens to cover the 35 mm. film than one to cover the 70 mm. film if they are of the same relative aperture, but, with the same relative aperture, the illumination on the screen with the 35 mm. film will be approximately one-fourth as great. In addition, projection from the smaller film at a higher magnification imposes more severe requirements on the steadiness of the film in the gate.

Reference

¹ See, for example, "The Distribution of Light in Optical Systems," A. C. Hardy, "Journal of the Franklin Institute, Vol. 208, No. 6, December, 1929. It may be remarked in passing that the f number is a measure of the illumination on the film only when the lens is focused on an object at infinity.

DEPTH OF FOCUS CHART
FOR DIFFERENT STOPS OF 50MM LENS AND
FOR CIRCLES OF CONFUSION OF 0.05MM



Screen Definition

by **DR. L. M. DIETERICH**

Consulting Engineer

Part 6

SINCE the last issue of this magazine, the author has been approached by several members of the profession with the request to publish a "handy" set of charts for the quick determination of "Depth of Focus" for standard motion picture lenses at various stops.

Mr. Fred Westerberg showed in the **International Photographer**, November 1930 issue, a very comprehensive diagram covering this subject and the author has, with his permission, used the fundamentals shown therein for the design of the two charts, herewith offered to the cameramen in a form which he hopes will be of practical value.

The examples embodied in these charts, when once studied, should make any further explanation superfluous.

Returning now to the continuation of the filter study of the last article and for the present especially referring to the "Moore" filters:

The majority of filters now on the market and in common use, suppress mainly to a more or less pronounced degree the blue end of the spectrum for the purpose of either increas-

ing definition by eliminating "blue" haze, cloud effects or to produce so-called night shots or moonlight effects by decreasing light transmission, but at the same time maintaining characteristic contrasts.

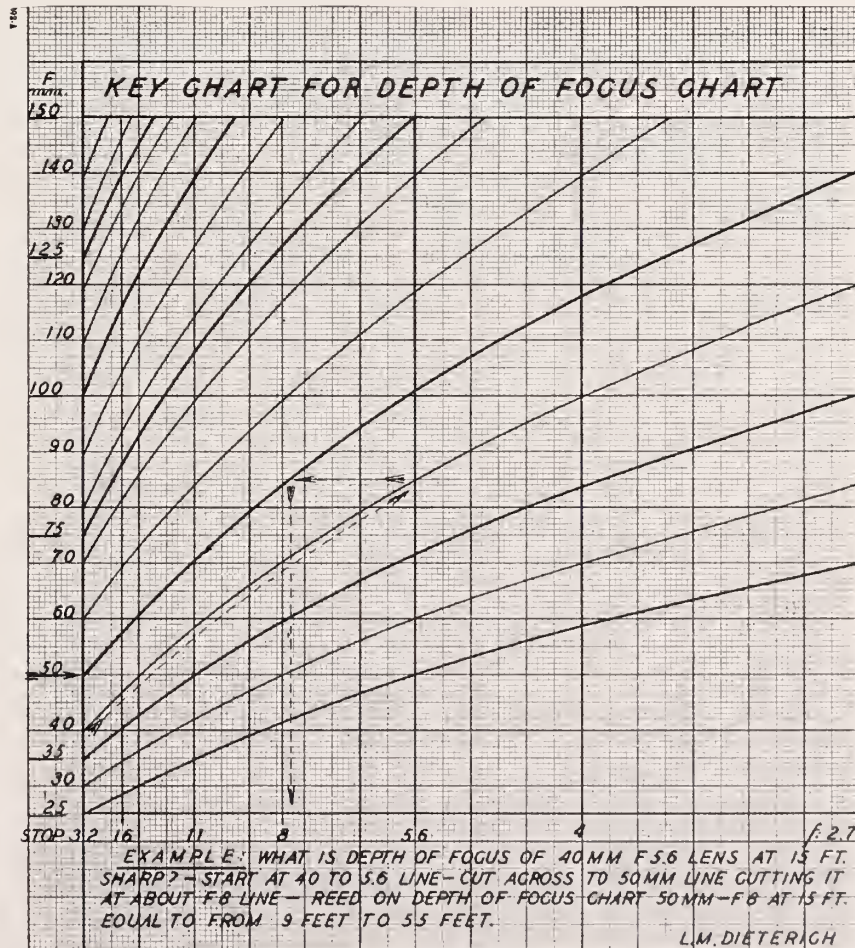
Such at present standard filter series, however, materially unbalance the actinic color reaction of standard film emulsions.

As an example a "night" scene photographed in daylight with a "night" filter and showing a North West Mounted Policeman in the characteristic red coat will, on the screen, depict him wearing a white coat. As another example, standard panchromatic makeup shows under use of such filters serious color distortions and so forth.

"Moore" filters obviate this destruction of actinic color balance by the proper blending of **red and green** filter elements.

The blue contained in green controls red to such an extent that the proper balance of color values (other than the blue only) is maintained in all of the desired special effects to a far more correct degree than is possible with commonly used filters.

(Continued on Page 37)



Ground Noise Reduction

R - C - A Photophone System

by **RALPH H. TOWNSEND**

EVER since Thomas Edison made his first sound recording on a piece of tinfoil, reproduced sounds have been what we might call "victims of circumstances." This is true not only of phonograph disc reproduction but that from film as well. Always has the listener been compelled to hear reproduced sounds of speech and music accompanied by needle scratch or extraneous background noises of various sorts.

In phonography this ever present background noise was and still is a source of untoward disturbance and annoyance. It has been reduced somewhat by careful attention to the many processes involved in record production. For instance, the wax on which the original recording is made has a homogeneity and uniformity undreamed of in the early days of the art. Electrolytic copper anodes, carefully prepared solutions, and accurate timing and temperature control now produce from the master record a copper plating of almost microscopic smoothness. The plastic compounds from which commercial records are pressed have been improved and refined to a remarkable degree.

But in spite of all this we still have needle scratch or surface noise to contend with.

Trouble Above 5,000 Cycles

With the advent of electrical recording the useful frequency range was greatly expanded. Electrical reproduction was capable of taking off the record all that was on it including surface noise and then what did we do? We found by analysis and measurement that a great deal although not all of the disturbance from background noise lay in the frequency range above 5,000 cycles. Electrical filters being easily constructed we then proceeded to cut off by means of a low-pass filter everything above about 4,500 cycles. The surface noise disappeared to a considerable degree but so did most of the higher frequencies we had worked so long and diligently to include in our recordings. However the ground noise was reduced, and that was what we set out to do, hence the experiment was a success.

The use of film as a medium on which to record sounds involved all of the trouble heretofore encountered in disc recording and reproduction. As a matter of fact there is a striking similarity between the processes. Instead of granular wax we now have to contend with emulsion grain; instead of graphiting, plating and pressing we have developing and printing; instead of a plastic shellac compound we have another piece of positive film stock as a final record; instead of defective phonograph needles which do not fit the grooves we have light slits which get out of focus.

You are no doubt all quite familiar with the reasons why ground noise interferes with reproduction and there is no necessity for a discussion of that particular point. If there were no ground noise or extraneous sound disturbances speech and music would be clearer—we will all admit that. The question is how can the ground noise be kept out or removed without interfering in any way with the wanted sounds or frequencies.

Mr. C. R. Hanna of the Westinghouse Company and Mr. C. W. Hewlett of the General Electric Company in the early part of 1929 did considerable thinking and research on this problem and at that time devised ways and means of ac-

complishing such an end. So far as we know Hanna's method is the basis of all those used commercially today.

Before we go further suppose we consider for just a few moments what ground noise is. A general definition would probably run something like this. "Ground noise is all sound evident in reproduction which was not present in the original sounds." You have all sat in theatres and heard this type of disturbance but probably few of you have taken the trouble to try and analyze this background noise. It has been analyzed, however, and found to consist of disturbances from many different sources.

Sources of Noise

For instance during a take on a stage or set it is almost a physical impossibility to have perfect quiet. There is always a certain amount of set noise due to movement on the part of the many people who are on the set at the time, the cracking of arc lamp housings or incandescent lamp housings, noise due to the cameras and their driving motors, to say nothing of a certain amount of noise which is caused by traffic outside the studio or extraneous disturbances in adjoining studios.

The next source of noise is located in the microphones and their associated amplifiers. No matter how carefully an amplifier is constructed we always find a certain amount of noise due to circuit conditions and tube characteristics.

If we add all of the components of noise mentioned above we find that up to the film we have a total noise level which may and often does assume considerable proportions. In some instances actual measurements indicate that this noise level is as high as 20 db. Since all of these disturbances are included in the signal fed to the recording mechanism, whether it be an aeo light, light valve, or vibrator, all of them make their impression in the resulting sound track on the film. Every film on which recording is made has a certain definite resolving power, that is, the ability to respond evenly to exposure. The emulsion on film which is susceptible to the action of light and development is a very sensitive medium. For this reason it is very desirable that it be treated with respect.

It is not reasonable to suppose that we can subject a film to under exposure and over development or over exposure and under development and get uniformity throughout the resulting opaque portions. In other words, unless the exposure and development is carried out with precision there is great possibility that the resulting granular structure will be a source of disturbance later on.

During the developing, washing, and fixing of film there are plenty of opportunities, even in a well-ordered laboratory, for the film to pick up small particles of dirt. By small I do not mean particles of a size visible to the naked eye. These particles may be, and usually are, microscopic in size. Their ability to produce noise, however, is still considerable.

The handling of film, that is, of negative film and also of the positive stock, during the printing operation is another potential source of noise. The developing and drying of the positive is still another source.

You may well ask at this point how can the disturbance, due to a recorded sound track combine with dirt and make more disturbance. If you will consider for a moment the manner in which a sound track on film is reproduced as sound the answer will be quite evident.

(Continued on Page 36)

DuPont Special Panchromatic Negative

by **D. R. WHITE**

THE DATA here presented give direct comparisons between the characteristics of DuPont Special panchromatic negative and DuPont Regular panchromatic negative.

From a purely scientific angle a complete analysis of such spectrograms as are shown in Fig. 1 would give a very complete knowledge and comparison of the emulsion characteristics. The knowledge would be so detailed as to be only of laboratory interest and would not be of value to film users in such form. However, these spectrograms are reproduced here to show that the color sensitivity of the two films is essentially the same. No regions of the spectrum included in the older product are omitted in the new and no large changes in relative sensitivity to different colors have been introduced.

The scale of reproduction of the spectrograms is too small to allow much reliable comparison of general film speeds therefrom. With this in view, H & D curves are presented in Fig. 2. The curves were plotted from exposures made in a non-intermittent time scale sensitometer, using a tungsten lamp as light source. The exposures for the curves marked "white" were made with the light from the tungsten lamp

not constant in either way, but must be used for so much of the work where a filter is needed that filter factors for it are of great interest. Table 1 gives filter factors obtained in sunlight and shows, therefore, the factor by which aperture or time should be increased to compensate for filter absorption.

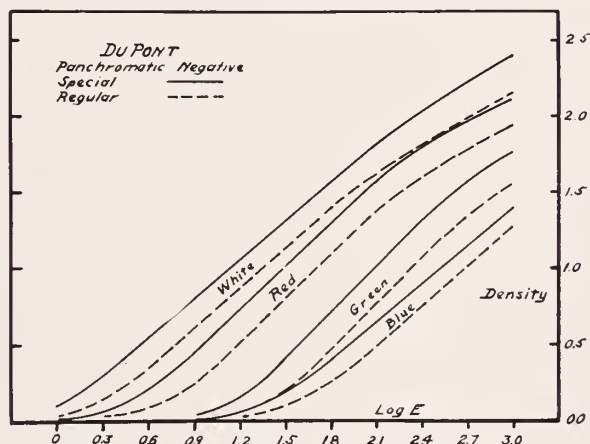


Fig. 2. H and D curves on DuPont panchromatic negatives.
White: exposed to tungsten lamp.
Red: exposed to tungsten lamp through A filter.
Green: exposed to tungsten lamp through B filter.
Blue: exposed to tungsten lamp through C filter.



Fig. 1. Spectrograms on DuPont panchromatic negatives
A. Special
B. Regular

falling directly on the film. For the curves marked "red" a Wratten "A" filter was placed in front of the light which was kept burning at the same position and brightness as for the "white" exposures. In a similar manner the exposures for the "green" and "blue" curves were made by the use of "B" and "C" filters respectively. The sensitometric strips were developed together for eight minutes in borax developer, with high agitation of the developer during development. The comparison of these resulting curves, in pairs, confirms quantitatively the fact which was qualitatively evidenced by the spectrograms, that there is no appreciable difference in relative spectral sensitivity in the two products. There is, however, a notable increase in speed of the Special film over the Regular. In actual practice it has been found possible to cut the set illumination from forty to sixty per cent in using this DuPont Special panchromatic negative.

From these data it is evident that the filter factors for the Special and Regular panchromatic negative films are the same within very close limits. The lens stop or lighting used with the Special film should, of course, be reduced to take account of the increased speed, but the filter factors themselves are essentially unchanged. As all successful filter users know, the correct filter factor for a given set of conditions depends upon three things, the filter, the lighting, and the sensitivity of the film. It is, of course, usual to specify a certain type or source of light and prepare a table showing the factor by which the stop should be increased to make up for the light absorbed by each of a series of filters. This is thoroughly satisfactory only when the light source is constant in quality from time to time and place to place. Daylight is

Where the light quality is not that of sunlight, these factors cannot be expected to hold accurately and a test shot should, of course, be made if the work is quite critical. Experience has shown that for shadow shots, when there is an absence of sunlight but a predominance of light from the blue sky, the factors for blue absorbing filters should be increased somewhat over the values given, and for blue transmitting filters, if used, somewhat decreased.

Table 1.

The body of the table gives filter factor for the Wratten filters, designated by letter, for sunlit scenes, for both DuPont Special and Regular panchromatic negatives.

Filter	Filter Factor DuPont Special DuPont Regular
K1	2.2
K2	3.1
K3	4
G	5
F	10
A	7
B	16
C	12

The photo-micrographs, shown in Fig. 3 show that the increase in speed has not been at the expense of grain size. The importance of this consideration is obvious. The two photo-micrographs were made under identical conditions and represent directly a true comparison of the grain sizes in the two products.

The dark room handling for camera loading and processing both of these negative films is most safely done in total dark-
(Continued on Page 33)

Hal Hall

SAYS

Thoughts in Passing

WONDER how so many cowboys manage to live thicker than fleas along Cahuenga Boulevard, and never seem to work Championship walkers ought to be discovered in picture studios. No matter what studio you visit, you get the idea that most employees must be hired to walk. They are always going somewhere in a hurry Wonder if they ever arrive Take note yourself some day Harry Burns, Editor of Filmograph, is now giving the Cinematographers a bit of mention in his paper Thanks, Harry, but don't call them "Unsung Heroes" Call them darned fine artists who do an excellent job and are rarely mentioned in the public press Other papers please copy Wonder what has become of the picture stars who couldn't learn to talk Also Wonder how some stars get along who in the silent days simply couldn't work unless an orchestra was playing favorite musical number Notice some of these are doing excellent work, but wonder why they got away with the bunk so long in the old days Still waiting to see who can tell Welford Beaton, Editor of Film Spectator, what a motion picture is Have often wondered why Welford doesn't tell us himself, as he is one of the most intelligent critics I have ever read Wonder how it feels to be hired by a big picture company to write stories then have big publicity break in papers only to be dropped three months later without having written a darned thing Irving Thalberg is one of the few really great production minds that has remained great throughout a long period of time Thalberg doesn't seem to suffer from brain fog no matter how long he works Remember how some said he would be just a flash-in-the-pan Perhaps one reason for his continued success is the fact that he devotes his time to intelligent thinking, and leaves public conversation to those who love to hear their own voices.

This Month's Cover

ON THE COVER this month is the daughter of one of the members of the American Society of Cinematographers. She is Joan Marsh, daughter of Charles Rosher, one of Hollywood's best known cameramen.

While only eighteen years of age, Miss Marsh can look back many years upon her screen experience, for she made her first screen appearance when she was six months old. She very early showed ability, and her father wisely guided her footsteps toward a career—taking her out of pictures to send her to school. Then she returned to the screen and was featured at Universal. From there she went to Metro-Goldwyn-Mayer, where she is now under contract. Her father is one of the outstanding cameramen at the same studio. Needless to say he is proud of his daughter, for she is the only cinematographer's daughter to gain a featured position on the screen to date, and she seems destined for stardom before she is through. So, we may well say our cover this month is an A. S. C. Cover.

Advertising Films

BIG business eyes are being centered these days upon the screen as an advertising medium. For years business has looked upon the screen and wished that the hundreds of thousands of theatre-goers could gaze upon delicious pieces of this cake or that butter, or this tractor or that brand of chewing gum, but until recently, the screen has fought shy of advertising, except when some particularly wise gentleman could have a closeup appear in a legitimate feature showing a particular brand of cigarettes, or something like that.

But, now the country has become screen-advertising minded—or, rather, the advertisers and many production executives. It remains to be seen whether or not the theatre audiences will feel the same way. The success or failure of these films will depend upon the manner in which they are presented—on whether or not the producers use common, horse-sense. The public will not, it stands to reason, pay good money to go and see washing fluid glorified—unless the glorification is real amusement or entertainment.

Richard L. Strobridge, secretary of the Newell-Emmett Company, New York, seems to have touched the right note in his remarks made recently at a "talkie advertising" demonstration given at the Advertising Club of New York. "The screen has very definite limitations as an advertising medium," he said. "It is dedicated, and rightly so, to the duty of entertaining those who pay their admission at the box office. Therefore, it can offer nothing but entertainment if it is to keep faith with the public."

He then pointed out that there is a strict line of demarcation between straight advertising films and those sponsored by an advertiser—the advertising film having a certain play on the advertised product, subtle or otherwise, while the sponsored film only mentions the advertiser in the credit titles, and is 100 per cent entertainment with no attempt at showing the product of the sponsor.

To our way of thinking, the sponsored picture can draw no criticism as long as it is entertainment. The straight advertising picture is the one that must be watched. There is no reason why advantage cannot be taken of the screen as an advertising medium—but—it would be just too bad if the screen became like the radio of today.

Mr. Nickolaus

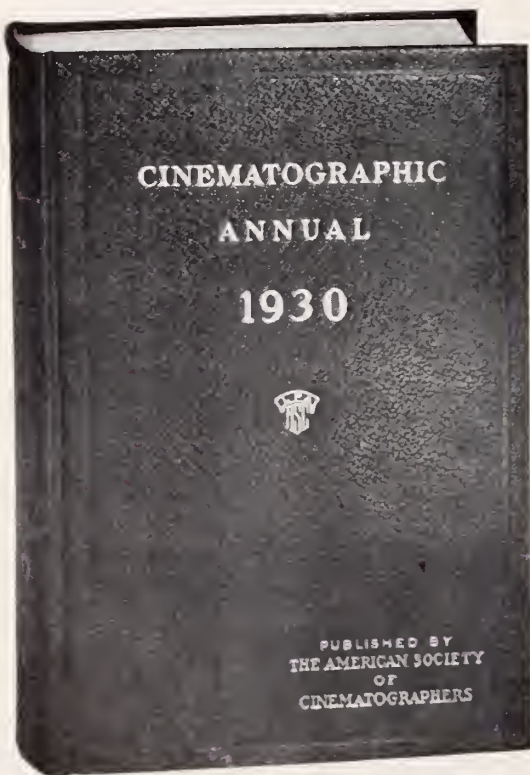
OUT AT the Metro-Goldwyn-Mayer studios in Culver City is one of the finest laboratories to be found in the motion picture industry. Very little is ever heard of it—perhaps because of the character of the man in charge. That man is John M. Nickolaus, a man who stands out as one of the most brilliant men in the motion picture laboratory field. He is an unusual man in the picture business, for while others hammer at the gates of publicity he goes about his business quietly and efficiently, thinking only of how he can make his department a better one. At this writing, a new laboratory is being constructed under his supervision. When it is completed it will be one of the finest in the industry, and will incorporate features that will be revolutionary. But, more of that angle later.



Two charming studies by A. S. C. members. Gilbert Warrenton is responsible for the snow scene; John W. Boyle for the marine.



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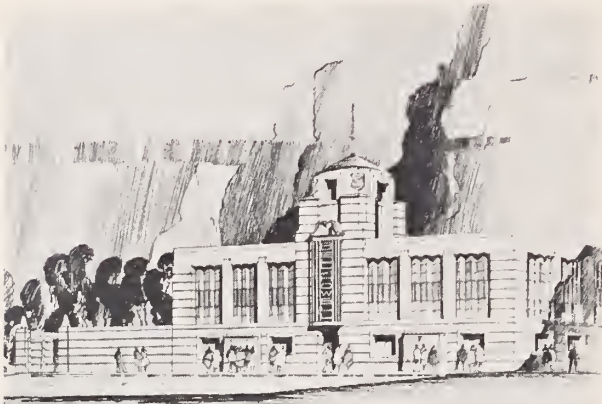
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EASTMAN SUPER-SENSITIVE

Panchromatic Negative, *Type 2*

Bell & Howell to Erect New Hollywood Building



THE BELL & HOWELL BUILDING IN HOLLYWOOD, CALIFORNIA
ARCHITECT: J. H. McNABB

J. H. McNABB, President of the Bell & Howell Company of Chicago, before his departure for the East, after a prolonged stay in Hollywood, has announced the acquisition of a site, having a frontage of 240 feet on LaBrea Avenue, south of Melrose, upon which will be erected a Class A building to house the West Coast branch of the Company.

The building itself and adjacent walled-in parking space for the convenience of Bell & Howell patrons, will extend over a frontage of 140 feet, the balance of the site to be reserved for future expansions.

The building will be two stories high and be topped by an attractive tower, lending grace to the structure and classing it as a new Hollywood landmark.

The phenomenal technical advances of the Motion Picture Industry has prompted Mr. McNabb to take the decision of establishing in Hollywood a fully equipped and competently manned Engineering Department, as a branch of the Chicago Research and Engineering Division of the Bell & Howell Company.

The Hollywood Engineering branch will offer its services to Cinematographers, Laboratory experts and Producers; gather and develop new ideas to still further the accomplishments of the industry with the double advantage of being "on the ground" where most technical developments originate and to have at its disposal the large resources of the Chicago long established research and engineering departments.

A well appointed "shop" will take care of servicing all the Bell & Howell machinery in use in the Western territory, and will employ only the most skilled mechanics thoroughly versed with the various machines, cameras, printers, splicers, perforators, etc. manufactured by the Company.

In addition to professional Cinemachinery, the Bell & Howell Company produces high grade Amateur Motion Picture equipment and the Amateur Division in the Hollywood building will be entrusted with servicing it.

Projection and editing rooms will be available to the public and constant displays of both professional and amateur equipment will acquaint those interested in the newest additions to the long list of Cinemachinery, which bears the Bell & Howell trademark.

Of special interest to Cinematographers is the establishment of a fully equipped lens testing department and to laboratory experts the establishment of a fully equipped printing room.

No expense will be spared to make this engineering and service laboratory one of the finest in the country, through the help of both personnel and equipment.

Mr. McNabb was one of the pioneer Eastern manufacturers to establish a substantial permanent industry in Hollywood, and the present expansion is further proof of his confidence in the future of the Motion Picture Industry and a tribute to the members of the industry, to their courage and their accomplishments.

At the same time that the Hollywood Bell & Howell building is being erected, further enlargements are carried on at the Chicago Engineering Plant. A story is being added to the two already existing, which will soon increase the activities of the Bell & Howell Chicago Manufacturing Plant and its New York and London branches.

Ground for the Hollywood Bell & Howell building is being broken at the time we are going to press and its occupancy is scheduled for the early part of July.

Electrolytic Condenser Data

ELECTROLYTIC condensers are very popular and are useful for certain purposes. They provide a large electrical capacity with a minimum of space and cost. In addition, they automatically repair themselves in event of puncture due to excessive voltage.

Here are the details of construction: There is a metal container, which is employed as the negative terminal of the condenser. In the center there is an aluminum plate, which is corrugated so as to enlarge greatly its surface area. The aluminum plate is the positive terminal. The electrolyte may be a liquid solution of borax or other special material, or may be a paste. In one instance the condenser is called "wet" and in the other "dry."

In theory, the liquid is supposed to react chemically with the aluminum, forming an extremely thin coating of gas all over the aluminum plate. In this way, the aluminum becomes one terminal of the condenser, and the liquid in the cell the other real terminal. The separating medium or di-electric is only the extremely thin layer of the gas between the liquid and the aluminum. Because of the thinness of this gas layer, the electrical capacity is far greater than with condensers which are separated by paper sheets or other insulating substances. It is important that the aluminum be connected to the plus terminal of the circuit.

The electrolytic condenser is principally serviceable for low voltages, but for higher voltages the great capacity available can be utilized by connecting several of these condensers in series. Condensers that serve for up to 500 volts DC are considered "low voltage." Electrolytic condensers can be used on DC only.

Exciter Lamp Discoloration

DISCOLORATION usually appears first at the top of the exciting lamp, which does not obstruct the intensity of the filament image. When checking a lamp for discoloration, remove the lamp holder from the exciting lamp housing and look at the lamp against a white background. This will give you positive proof of discoloration at the top and walls of the globe. Make sure the glass is perfectly clear and clean in front of the filament.

Again, warning should be issued against lamps with saggy filaments. When the filament becomes slightly saggy, discard the lamp. Inspect sound lamps daily, and be assured against loss in volume and injury to sound film reproduction.

Slow-Motion Pictures and Glider Pilots

SLOW-MOTION pictures of trained eagles and falcons in flight are being used in Germany to instruct pilots in the handling of gliders.

A training school for glider pilots at Rossitten used tamed falcons and eagles as models via the slow-motion film, and the student pilots study every phase of the birds' flight and movement of their wings.

Laboratory Department

Conducted by EMERY HUSE, A. S. C.

Desensitizers and Super Sensitive Films

IT IS often desirable to inspect film during development even though the time and temperature method can be used to produce negatives of a definite development contrast. With panchromatic emulsions the use of desensitizers has been made with some degree of success. However, desensitizers are not in general use in the motion picture field, but with the advent of the Super Sensitive type of panchromatic films questions relative to the more extensive use of desensitizing agents have often arisen. With very fast emulsions certain limitations are imposed upon the amount of illumination permissible in the dark rooms while handling the film. For Panchromatic Negative the Wratten Series No. 3 safelight is very successful. With the Super Sensitive type of films, however, this same light can be used but the brightness emitted by it must be appreciably diminished. As a result of this it is only natural that the desensitizing question should arise.

A photographic desensitizer is a substance which has the property of greatly diminishing the sensitivity of a photographic emulsion toward light action. This agent must not affect the latent image already present on the film and furthermore it must not interfere with its subsequent development. The most important reasons for using a desensitizer are: 1—To permit the inspection of panchromatic film during development. 2—To prevent aerial or oxidation fog.

Desensitizing dyes can be used either in a preliminary bath or in the developer itself. This latter condition, however, depends greatly upon the chemical constitution of the developer. Concentrations of desensitizing dyes as used in preliminary baths are of the order of 1 to 5000 or 1 to 10,000 and the film is bathed in this preliminary bath for one or two minute periods just prior to development. This operation of course must be carried on either in the dark or with the proper safelight. When desensitizing dyes are used in the developer the concentration is usually of the order of 1 to 25,000, or less, and the film is left in the developer for about two minutes before exposing it to a brighter safelight having the same spectral distribution. Unfortunately, however, most desensitizing dyes when incorporated in a single solution developer cause a precipitation of the dye, which results in trouble.

With the rack and tank method of development desensitizers hold a relatively more important position but with the increasing use of developing machines for negatives visual inspection becomes less and less important, that is, visual inspection for quality and not for machine trouble. It would seem, therefore, that there is relatively little application for the use of desensitizers in developing machines.

In the consideration of desensitizers something must be known of their strength, their effect upon the latent image, their effect upon development, fogging action, solubility in a developer, and various other functions. Complete studies have been made of desensitizing dyes considering these facts. Such dyes as phenosafranine, pinakryptol yellow, pinakryptol green, aurantia, and several others have been thoroughly studied. One of the most promising of those studied is pinakryptol green.

In studying desensitizers, as mentioned earlier in this article, it is necessary to give consideration to the developing solution, especially when it is planned to incorporate the desensitizing dye in the developer. It is safe to say that approximately

ninety five percent of the negatives developed for motion picture production are developed in the borax type of developer. The use of a desensitizer in this type of a developer causes a precipitation and therefore should be ruled out. However, if the use of desensitizers is seriously considered they should be used in a preliminary bath before the film reaches the developer. In this case a preliminary bathing of one minute in a solution which contains 1 part in 10,000 of the dye chosen would decrease the sensitivity of the Super Sensitive type films sufficiently to permit the use of a Series 4 safelight at a distance of approximately a foot during development.

This article was intended primarily to give a brief discussion of desensitizers and their effects on Super Sensitive types of emulsions. That has been done, but in closing it should be stressed that it is much simpler and in the end much more satisfactory and less productive of trouble if work is done in total darkness or in a Series 3 safelight in which the amount of light has been cut appreciably. It has been found that most commercial motion picture laboratories prior to the advent of Super Sensitive emulsions were using safelights at a very low level of illumination. Many laboratories handled the Super Sensitive emulsions under these same conditions without fogging. It would seem, therefore, that the use of desensitizers would only complicate and not assist in the operations in the laboratory. As a final statement it is recommended that desensitizers not be used except as a last resort.

Patent Abstracts

U. S. 1,780,585. A. Fried. Assigned to William Fox Vaudeville Company. A tripod head having means whereby a camera may be rotated both about a vertical and horizontal axis, including means for steadying such a movement.

U. S. 1,777,828. L. DeForest. Assigned to General Talking Pictures Corp. A method of making continuous photographic sound and picture records of the same scene, which comprises employing a plurality of cameras at different focal distances from the scene, driving the cameras in synchronism, continuously photographically recording the sounds originating in the scene, photographically recording the scene by the cameras, and printing on a single positive film, the desired portions of the films of the different cameras including the sound record to obtain a continuous sound and picture record.

U. S. 1,777,037. L. DeForest. Assigned to DeForest Phonofilm Corp. A binaural reproduction of sound comprising a film having different colored sound records thereon superimposed one on the other and longitudinally spaced apart one with respect to the other, placed between sources of light and light-actuated cells sensitive to different wave lengths, and means separately actuated by the currents generated in each of said cells for producing sound.

U. S. 1,779,653. G. N. Ball. Assigned to Warner Bros. Pictures, Inc. A motion picture camera having a sound insulating housing and provided with sound insulating shields for the camera and associated parts, said shields being of such a character as to provide easy access to the camera reels and other parts.

Eastman Announces Super-Sensitive Panchromatic Cut Film

ONE of the most important announcements in years to portrait, commercial and still photographers, is the announcement by the Eastman Kodak Company of a new Super-Sensitive Panchromatic cut film. Many photographic difficulties of the past should be swept away by this improvement of light-sensitive emulsions.

"With incandescent lamps," states the announcement, "the new super-sensitive panchromatic film is from two to three times as fast as Portrait Panchromatic, a 'speed' sensation when announced two years ago. The sensitivity of the super-sensitive panchromatic film, usually termed speed, is greatest when incandescent lights are used, because this form of illumination contains a higher percentage of red than daylight or the light from arc lamps.

"To give one the best idea of what the extreme color-sensitivity of this new super-sensitive film means to the man who works with artificial light, we should compare it with Par-Speed portrait film because this is a standard material used by both portrait and commercial photographers.

"With clear incandescent lamps the Super-Sensitive Panchromatic is from five to six times as fast as Par-Speed. This means that if you have been accustomed to making exposures of from two to three seconds with Par-Speed film, your exposures with the Super-Sensitive Panchromatic would be about one-half second. If you have used enough light to photograph children in one-fifth of a second with Par-Speed, your exposure with Super-Sensitive Panchromatic film would be one-twenty-fifth of a second—too fast for a bulb exposure.

"Such speed opens up unlimited possibilities in both commercial and portrait photography. The commercial photographer will look upon this increase in speed, not as much as a means of making fast exposures, but rather for the advantage of making exposures with less light. When the photographer goes on an outside job he can feel safe with half his usual amount of lighting equipment, and will secure twice as much benefit from the illumination he finds on location. And for studio set-ups, which often require long exposures, exposure time will be cut more than half, which is a great advantage in studio work.

"The same applies to home portraiture. Lighting equipment has made the work of the home photographer rather difficult. If he now has ample light, he can either be relieved of much of his burden, or shorten his exposures and be more certain of negatives which do not show movement. This latter procedure is the logical one for photographing children.

"Industrial photographers are often faced with the problem of obtaining sufficient artificial lighting for subjects such as 'long shots' of factory interiors or close-ups of machines with operators. Flashlights are banned in many plants, although the new photo-flash lamps have entirely eliminated smoke and the fire hazard. Since the Super-Sensitive Panchromatic film is especially efficient under artificial light, industrial photography is obviously simplified.

"First—photographers will no longer be required to clutter working areas with large numbers of heavy lamps, and thereby avoid hampering general factory operations.

"Second—the amount of electric 'load' is cut down. Third—where the usual amount of artificial light is available, much shorter exposures are possible. This is valuable in arresting the motion of people or moving objects. If shorter exposures are not required, smaller lens stops can be employed to increase sharpness and 'depth of field.'

"The value of the Super-Sensitive Panchromatic film is equally well applied to industrial photo-micrographic work, such as studies of metal structure. The qualities of the new film will answer the requirements for combining speed, color sensitivity, and fine grain.

"The advantage of reducing exposures to a minimum when working under artificial light is highly valuable in doing live model work. No longer are models required to endure long, strained poses that often result in stiff and ungraceful postures, and incidentally a series of 'retakes.' In the past it has not been uncommon for model 'shots' to require five, ten seconds—even more—quite a long time for any but highly trained models to remain motionless. Short exposures usually result in more pleasing poses.

"The new panchromatic emulsion is, in addition to all standard sizes for still photography, available in 35mm. motion picture film. Industrial photographers who do motion picture work will find that when using the super-sensitive panchromatic film under incandescent lamps, the usual amount of light can be reduced from one-third to one-half. This factor is very important in modern time study of factory operations with the motion picture camera.

"The sensitive emulsion of this new film is very closely related to one prepared for astronomical photography, as well as to the new Wratten Hypersensitive Panchromatic plates for the high-speed requirements of newspaper photography under artificial light. Astronomers, it has been learned, used the new emulsion recently in making observations seeking to discover whether there is moisture in the atmosphere of Mars. The necessary time for exposing the plates in the spectroscope was reduced from ten hours to four in the observations in question.

"Eastman's new Super-Sensitive Panchromatic film presents the very great advantage of speed without the sacrifice of those qualities so essential to fine portraiture or commercial photography. It has fine grain, excellent exposure latitude, and builds up in the developer without blocking.

"There is one very important precaution in the use of this new film which is necessary to good results. A film so sensitive to light of all colors can not be exposed to light of any color in a dark room without noticeable 'fogging.' The film must be opened, loaded, and developed, in total darkness. After about five minutes of immersion in the developing solution, a certain amount of desensitizing takes place permitting the use of a Series III Safelight for the remaining period of processing. It is recommended that the time and temperature method of development be used when working with this high-speed emulsion. Once the time and temperature system is established as standard practice, it will be found to be the most satisfactory method of development."

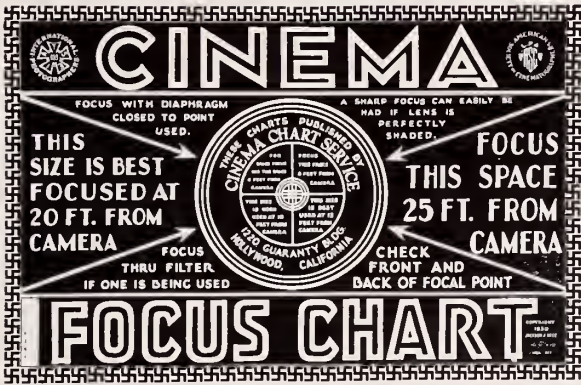
Milestone Develops Unique System

TO LEWIS MILESTONE, director of "All Quiet on the Western Front" and "The Front Page," goes credit for a very novel and valuable innovation in picture making.

A scene sketch chart is now used by Milestone as a "first-aid" in the production of his pictures. In other words, a complete scenic record of the entire play is sketched from the proper camera angles before the picture is filmed. Each set of characters in the action of each sequence is pictured by the artist as if it were from the eye of the camera. Beneath each sketch on each page of the chart is the dialogue and cues pertaining to the action. Thus this scene sketch chart proves an invaluable guide not only for director Milestone, but for his entire technical staff as well. The cameramen, film editors, assistant and technical directors have a daily reference index for their assistance in working out the details of each "shot" in the picture.

For example; after each day's work is done the assistant director calls the cameraman and staff together, to refer to the sketch chart for the next day's work. Thus when director Milestone arrives on the set each day he finds everything ready to go.

Another Device From Jackson Rose, A. S. C.



WE OFTEN wonder when Jackson Rose sleeps. Jack is one of Hollywood's best known cameramen. But he is equally well known for his creation of new gadgets and devices to aid in the cinematographic field. Some time ago he brought out a focus chart that created much interest. Now he has improved upon that chart and has produced a gadget that should prove a very valuable adjunct to any cameraman's equipment. It is a combination focus chart and scene slate. On one side is the chart, on the other the slate. The entire gadget is of a heavy quality fabrakoid. The entire chart and slate folds up and when ready for packing or putting in the pocket is 12 inches x 4 3/4 inches in size. On the outside of the gadget is a place for the camera report for the laboratory. This device should be very valuable on location trips.



COMPLETE EQUIPMENT

SEVEN REASONS WHY YOU SHOULD USE THE

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Amateur Movie Making

◆ by HAL HALL ◆

WHEN APRIL COMES—to most people it means that Spring is here. But, to the Amateur movie maker, it means that another delightful season for picture making is at hand. Already the home movie maker is dreaming of the coming vacation and the things he or she will do with the movie camera.

Fine—but why not pause for a moment and check up on what you did wrong last Spring and Summer. Not only check up, but sit down and make out a list of the faults of the past. And when this list is made out, just paste it in your camera case, or anywhere else you choose, and profit by the mistakes of the past. None of us are without faults. We all have made mistakes; probably will do so again, but we should not repeat the same errors—that is, if we do a little checking on ourselves. And Springtime is the best season to make this check, for most of us (except those of us who are fortunate enough to live in Southern California) will do most of our picture making in the Spring and Summer.

First—why not check the camera and camera equipment. If you do not trust your own judgment and mechanical ability, take your camera to the camera hospital and have it inspected, thoroughly. If any repairs are needed, have them made, by all means. Have the projector looked over, for after a winter of rather constant use, it may need inspecting. The least one can do is keep his equipment spotlessly clean and well oiled. As a rule you can judge the seriousness, and the ability, of an amateur by the condition of his camera. And, surely, a camera deserves attention. The equipment of a professional cinematographer is immaculateness itself. If he did not give his camera care, his work would suffer. True, the amateur's livelihood does not depend upon his camera, but his personal satisfaction and artistic reputation do depend upon the way he keeps it.

In most amateur outfits the matter of maintenance is simplified because of the fact that the more delicate parts are tucked away out of sight and danger. But the inside of the camera box should be kept spotless and free from shreds of celluloid and other particles that do gather. Those parts that require oil should be oiled regularly—but be cautious,

Lenses

And then the lenses. Many lenses are horribly abused. I have seen some amateurs take a fairly soiled handkerchief out of the trousers pocket and rub vigorously over an expensive lens surface. God help the lenses of such amateurs! Be careful how you clean that lens. Do not use your handkerchief, or the sleeve of your jacket. Use only the very softest cloth, or, still better, a special lens tissue for the purpose. Silk should not be used, and this writer would never use the so-called lens fluids or liquids that are supposed to clean. When not in use your lenses should be kept covered and shielded from the direct rays of the sun which seriously injure the polish. It is best to keep your lenses wrapped in a piece of soft cloth when not in use. If possible, have a special lens box or case. A good rule is to have a special box to hold both your lenses and your filters. In this way, you will always find them ready for use and in excellent condition.

Speaking of filters, be even more careful with them than you are with your lenses. Keep them absolutely shielded from

the sun's rays, and remember that, at best, filters have only a definite lifetime. The filters used by amateurs are fairly staple, but they deteriorate to considerable extent, and should be replaced. Right now is a good time to look yours over, and make the necessary replacements before you start your Spring and Summer cinematographic activity. Remember, that a replaced filter today may serve you a lot of grief when you are back in the wilds on that fishing trip before long—back where you can't even find a human habitation, much less new cinema equipment. If you use them much, it would be a wise plan to replace them at least a couple of times a year. So, if you have not done so since last Summer, look them over now and be sure of your filter equipment.

While some of the professional cinematographers maintain an assortment of several dozen filters, the amateur, of course, need use but two or three. The most useful pair probably are the K-2 and the Aero No. 1. With them most conditions ordinarily encountered can well be taken care of. For most scenes the Aero No. 1, very practical for general use, can be used; but when shooting through any considerable haze, or on subjects where more marked correction is needed, the K-2 is very useful.

The Tripod

And, how about that tripod? Is it in first class shape, or does it need some repairs. You know, that a wabby tripod may spoil the finest shot of the coming season. Perhaps you do not use a tripod. If you do not, let me advise you here and now to get one. The novice may think that the tripod is merely a useless bother; but to the advanced amateur it means security—it is a necessity, not an accessory. No matter how good your camera, you cannot expect to get a steady picture with an unsteady support. Common sense tells you that. No human hand can hope to rival in steadiness an inexpensive tripod. Long, long ago the still cameraman learned that the tripod is steadier than the hand. Most of them would as soon leave filter or film behind as to leave the tripod. It is obvious that the movie maker should use a tripod, also, if he wishes to get the best results. There are many tripods available to suit the individual purse—get one if you have not already done so, and see the improvement in your cine work.

Reflectors

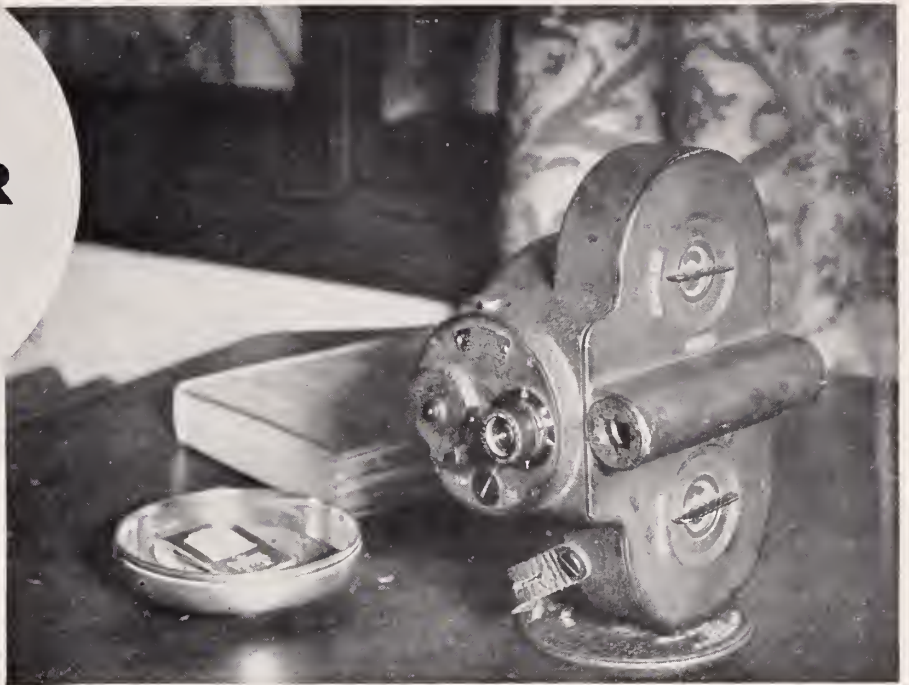
Another mighty useful device for advanced amateurs is the reflector. Reflectors are as vital to excellent outdoor cinematography as a rudder is to a ship. They are the means by which the cinematographer controls the sunlight which paints the picture as he wishes. The professional cinematographer would not go on location without reflectors—they are invaluable. Likewise, they can be of untold value to the amateur who is ambitious and wishes to secure the very finest of results.

The amateur who is fairly handy with tools can make his own reflectors at a very little cost or effort. They are merely large sheets of compo-board covered with aluminum leaf. A perfectly smooth surface makes the hard reflector, or the type that reflects the maximum of light. The soft or diffuse reflector is about the same, only with a matte surface. Either of these will do well with any film, but studios sometimes

(Continued on Page 35)

**NO
FILMO
HAS EVER
WORN
OUT**

*What you see, you get
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CARTER HARRISON, JR., owns this veteran Filmo. He has put it to every conceivable test since it was acquired in 1925. In Turkey, along the Mediterranean, and throughout Western Europe, it has served its owner. His father, Carter Harrison, Sr., former Mayor of Chicago, has used it in his travels in China, Africa, and India. This Filmo has an unblemished record of dependable performance . . . a record it will successfully defend for years to come.

APATRON at the camera counter of a large store was once heard to remark as he held a Filmo camera in his hands, "This is solid, life-time stuff!" A layman can see the value in a Filmo before he ever owns one. For its sturdy construction and the precision of its parts at once suggest the years of trouble-free service which lie within.

Have you ever held a Filmo in your hands, examined it closely? To the trained eye of the amateur, there is a distinct lure in its finely made mechanism, its extremely simple operation. It is a camera that invites you to test it under every conceivable photographic condition . . . a camera that has your confidence, even before you test it. It is a product of Bell & Howell, makers for more than 24 years of the professional cameras used by the world's major film producers.

Filmo Cameras may be had for as low as \$92. We shall be pleased to send full information and description on request. Ask for Booklet No. 35. Or call at your nearest Filmo dealer's.

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BELL & HOWELL FILMO
PERSONAL MOVIE CAMERAS AND PROJECTORS

**New Accuracy in
"Still" Photography
Exposures**



Now, "still" camera exposure reaches all the scientific accuracy of lenses and shutters. The new Bell & Howell Model B Photometer, in ten seconds, gives you the lens stop for any shutter speed with a precision which assures perfect photographic results. You sight directly on the object through the Photometer lens, fitting your exposure to high lights, shadows, or average light intensity. Filter factor and emulsion speed modifications are also made by the scales. Write for details. Photometer, Model B, for "still" cameras, \$17.50 (with case, \$20); Model A, for Filmo Personal Movie Cameras, same prices.



Upper left, a typical Normandy cottage. **Upper right**, Normandy orchard. **Left center**, Abbaye aux Hommes. **Center**, Paul Gassion. **Right center**, Abbaye aux Dames. **Lower left**, Gypsies make a stop. **Right lower**, Church of St. Pierre.

Babbling About Brittany

by LAWRENCE GRANT

Mr. Grant, one of Hollywood's best known actors, is also one of its best known amateur cinematographers and photographers. He never goes afield without his "still" and 16 mm. movie cameras. This is the first of a series of articles he has prepared for this magazine, dealing with out-of-the-way places he has visited and photographed.

—The Editor.

REMEMBER once being shown over a stately cathedral by a serious minded guide, and we, being young, were making flippant remarks about some ribald carving when our guide reproved us saying: "Let us leave the follies and frivolities of the world, and note the beauties of the architecture."

So would I say to those about to visit Brittany: "Let us leave behind the sophistication of our usual lives, let us go with the spirit to enjoy and not to cavel, for our pleasure in travel is governed by our own receptivity, we get what we give, and I would rather travel with a Ford and smile than a Rolls Royce and a frown, for with just a little money and much courtesy, together with a desire to be pleased, you will be given in return all the politeness, all the help, all the hospitality you can desire."

Don't do as many travellers, of all nations, do and give the impression that you are a person of a different and superior planet looking down upon the antics of the natives as something to be tolerated; don't regard every custom as "barbaric" because it is not so done "way back home."

Don't be like the Englishman, who, when asked if he liked Hollywood, said: "Yes, but it is so far away." And the enquirer asked: "Far away,—from where?" and instantly the reply came: "From England, of course; where else could I mean."

If you will forget to expect hot water in your faucets (if any) or ice water in your glass, forget central heat, elevators and hurry, I can promise you such kindly people, such foods, at such attractive prices, as you have never had elsewhere in the world, peasants who will delight you, fisherfolk who will charm you, and plumbing (again, if any) that will astound and shock you, plumbing that could not be called plumbing, because plumbing means water, and water, many times there is not, only a sort of broom-like plunger,—but why go into that?—for at times it is simple, Oh! very simple,—simpler even than the peasant folk, and all this you will find in that far Northwestern corner of France—Armorica—for that is the old, old name for it, not America—though the first American troops, and many after them, did land there—but Armorica—now called La Bretagne.

Only I must stop off on the way at a Norman city, just on the borders of Brittany, called "Caen," famous for William the Conqueror, Charlotte Corday, Metal work, lace, Cathedrals, "tripe a la Caen,"—and "Calvados." Of all these, give me Calvados. Very old, very "forte," very heady, very comforting Normandy after dinner cordial, that delicious brandy made from Normandy apples, which is so potent that it was absolutely forbidden to soldiers in the city in war time, so naturally when one of them dined with me at the local hotel he had to have his in a demi tasse, just like being at home.

I met this soldier, Paul Gassion, while I was exploring the Cathedral of St. Pierre, and he very kindly drew my attention to some small carvings in the arch which would have otherwise escaped me, and which would never be approved by Comstock, but had been slipped into other ornate work by some facetious architect or sculptor. And by the by, to those in search of the curious I recommend that they closely examine the clapper of the great bell on the turret top of that lovely mansion in the city called "Hotel de Than." It consists

of portions of the human anatomy never meant for striking belles.

Don't miss it. Those who have seen it will understand my mis-spelling the word belles!

This same soldier had been a naturalized American earning \$150 a week as interior decorator in San Francisco, but had left immediately in August, 1914, to accept a penny a day and his uniform from France.

Caen has been called the "City of Spires" and when one asks "why so many churches?" I reply, in French, "Cherchez la femme," for the best were built on account of a woman. Let me see; I can remember St. Pierre, St. Etienne le Vieux, Notre dame de Gloriette, the Abbaye aux hommes, and the Abbaye aux Dames; the last two built by William the Conqueror, and Mathilda his wife, in penance for marrying within forbidden degree of relationship.

Then another, I forgot which, was built by William as a personal penance. Having suspected Matilda of some wifely digression he caused her to be tied to a horse's tail and whipped through the streets of Caen (for he was a great Conqueror, first he conquered Mathilda, then he conquered the English). Later when he found he had been a little hasty, he built another church, which, while very good for art, was not so much good for Mathilda.

During this processional whipping she only complained at one spot, where she said "I am cold"—for in order to make the whipping effective she had been clad only in a chemise, or rather in those old times, "a shift," so that she could be hurt physically as well as morally. This is also commemorated by the street where it occurred, being called to this day the "Rue Froide." Better be Lady Godiva and ride naked and be peeped at than at the tail of a horse and be whipped. But either way the lords gave their ladies short shrift in those days.

You begin with the primitive even here, for I saw a street water-sprinkled in a very ingenious, even if somewhat ineffective, way. No sprinkling cart seemed available, so the city worker let water flow from a street faucet and run down the gutter. Then he, with a very wide spade, caught the water and threw it off the spade over the street. This is quaint, but let us pause to realize that today France is short of labor. No unemployment mostly because they have not allowed vast machinery to supplant man power and man-made things.

It makes one think.

Their sense of humor is quaint, too. I dined in a small hotel restaurant, and round the room were eight enormous distorted mirrors. They made you long and thin, or short and fat, and crooked and twisted, and a monstrosity in every way, but each one different. And then, as you left, one good glass but of a color that made you pale green!

There were rows of little pigeon holes in the dining room, like letter boxes at a hotel desk, and I wondered what for. I found they were to keep the rolled-up napkins of any guest who stayed for more than one meal!

And I thought of the man who, in a small Canadian hotel, asked for sheets on his bed, finding he had only blankets, and was told: "If you want sheets, you'll have to wait till the 10:40 train goes out, because we are using the only pair we have for table cloths just now!"

Now we will get on to Brittany.

Just inside the line from Normandy is Brittany's, even France's, greatest Gothic Treasure—one of the world's architectural marvels—Mont St. Michel. Very few people know

that due north of the spot off the coast of Cornwall, England, is another St. Michael's Mount, on a spot just like this in France, about the same distance off shore, and with a cathedral building so similar that a picture of one looked at without close examination may easily pass as a photograph of the other.

A little place called Pontorson is the getting off place. That is, where the nearest railway is, and then by tram, bus or car. The last time I was there no tram was running and I, with one other voyager, an architect and lover of Mont St. Michel, M. le Brun from Paris, were the only ones off the train.

The guide book says that at the station at Pontorson:—"L'ete, des voitures publiques (prix variable) font, parallelement avec le tram, le service du Mont." In this, if nowhere else, the guide book said a mouthful. For outside was an old car, and an older "wagonette" with a still older white horse. Both besought me. How much? Six francs. Too much. M. le Brun arrived on the scene by this time. How much for two and baggage? Both shouted "ten francs." The white horse parried with "nine francs." The car came back with "eight, fifty." From then it was a battle of bidding in Dutch auction style, until rock bottom arrived at "five francs" for the two. One franc less than the first bid for me alone, but they both stood firmly on this sum, so it became a matter of choice. Would the car start "toute suite"? "Mais certainement, Monsieur, immediatement." So we chose the car, and we started, chauffeur, le Brun, baggage and me, including cameras. Oh, yes, and a Gend'arme. We made about two hundred yards, and then bang! A tire blown out. Evidently not unexpected, for he drove into a nearby farmyard, got a new tires out of some cache he had there and began to adjust it.

During this replacing he cursed long and loudly, by "bell, book and candle" every saint in the calendar—and St. Michel in particular.

Le Brun, the Gendarme, and I went off to a buvette during this and drank cider, and when we returned we found that he was much chagrined to find that it was impossible to pack a large, broken and very muddy bicycle with us as excess baggage.

However, we stopped once more at the Mairie, and though we had failed with the bicycle, we here succeeded in taking on two cans of petrol, two circular loaves of bread—with a diameter of 3 feet each by actual measurement—and one French officer.

The officer had to drive, the chauffeur sat astride the bonnet, and off we set on our five or six mile journey to the gateway.

Why is there so much romance in the word "mountain"? Mount Ararat—Mont Martre—Mont St. Michel—Monte Carlo—and none of these places will disappoint you—and after Monte Carlo—then, perhaps, the Mont de Piete, by which romantic name the pawn shops of France are, for some inexplicable reason, always called.

Along the causeway to the entrance, le Brun all the time gouching because they had made the causeway permanent, and therefore the Mont a promontory, instead of an isle reached only over the sands at high tide. Much controversy had raged about this between artists and materialists, and all over the place there were still "affiches" remaining on the walls at many spots, put there by a French Artists Association: "Il faut que Mont St. Michel reste une ile!" No use, the materialists built the Causeway.

Mont St. Michel, famous for the great Gothic building; for the marvelous portion of it, called La "Merveille"—for the swiftest tide, going in and coming back with the speed of a galloping horse, and very dangerous for strangers who may be caught and drowned; for dangerous quicksands, also; for the salt marshes on which graze the sheep, later to become

that delicious "pres sales" on the menu of your high-class restaurant in Paris; and for the giant omelettes of Mere Poulard, alas, no more of this world, though just inside the gates where the old Restaurant Poulard stood are several places, all claiming to be "the old original Poulard."

On this visit of mine, though it was summer and season's height, when accommodation should be at a premium, not a soul there, not a single soul, but just le Brun and me.

The trains arrived punctually at Pontorson. The women left in charge of the hotels knew how soon to expect the cars coming along the causeway, and there they would come out along the battlements, with elbows on the walls and field glasses pressed to their eyes they would scan the distant road for these cars. It was pathetic to see them, they looked like so many disconsolate "Sister Annes" waiting for someone who never came.

The main hotels are all in a row on the top of the battlement wall, and facing the mainland. When we arrived the excitement was prodigious, and the reception royal. The hotel proprietor, at whose house we decided to stay, was regarded as a person who had drawn a prize in a lottery, and to the credit of these wonderful people, the women of France, we were cooked for and served as marvelously and as perfectly as if we had been visitors during the most crowded and cheerful season.

No young men, only old men, and women carrying on—"pendant la Guerre."

As for the Cathedral with all its ramifications it is beyond description. How any people, without modern mechanical contrivances, transported across the dangerous sands from the mainland such enormous blocks of stone, and having got them across how they managed to get them into their respective places in the "pyramid of glorious antiquity" and how they carved this great mass into the infinite detail of exquisite art, is a mystery.

It is beauty beyond comparison. To stand at one end of the refectoire and observe the perfect invisible and indirect lighting, the whole immense room being evenly and brightly lighted, puzzles one until you discover that deep set between each of the pillars that run down the sides is a long gothic window. The picture on the other side shows this lighting very clearly. The cloisters are of the most delicate beauty, while outside, the walls and staircases are massive beyond words. It is truly "La Merveille."

When I left, and of course I had to leave, and the chauffeur knew that, he charged me ten francs for going back alone—so he evened up matters with me there.

In getting him, I encountered one of those strange viewpoints you so often find in France. There was no telephone, so when I wanted him I was to telegraph—not to his house, as he was away all day, but to the station where he would be in and out all the time—so I sent the telegram there.

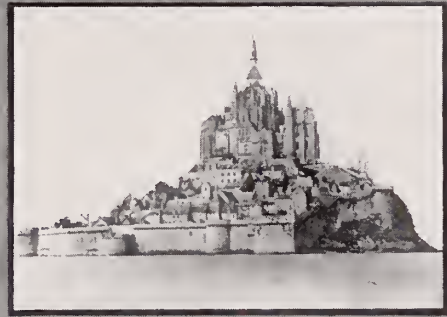
"But," said the operator, "you are charged fifty cents extra for delivery as it is outside the free city delivery."

I said "That cannot be. The railway station where I am sending it to this man is in the center of Pontorson."

"That may me," said she, "but though it is sent there, and will be delivered there, the man resides outside the limits and therefore it must be without doubt that you pay fifty cents additional."

"C'est la France."





Upper left, Mont St. Michel from mainland. **Upper right**, Mont St. Michel from the sea. **Center left**, Soldiers going on duty. **Center**, Heavy architecture of St. Michel stairway. **Center right**, Children going to church. **Lower left**, Salle des Hotes. **Right lower**, Refectory.

Cogs in the Wheel

by **EARL MILLER**

Chief Electrician Paramount-Publix Corporation

WITH the introduction of sound pictures, the cooperation given the sound department by other production units of the motion picture industry is in a great measure responsible for the progression that the "talkies" have made.

In an endeavor to bring sound production to a higher point of achievement, new features constantly are being introduced, many of which already have been adopted—but only after they have passed through experimental stages and have been subjected to tests that have proven costly to the industry.

Endeavoring to minimize production costs while contributing efficiency to the production of sound pictures, departmental executives have given materials and equipment exacting tests, which have resulted in the junking of much equipment



Earl Miller

that was satisfactory prior to the advent of the microphone. These antiquated products have, of course, been replaced by modern equipment.

And now, with the introduction of supersensitive film, the industry is confronted with similar problems to those solved when sound pictures first were undergoing the transitory stages of development. In no other branch of motion picture production is the importance of cooperation more essential than in the electrical department.

The lighting requirements of supersensitive film demand the resourcefulness of our most adept studio technicians. The success of supersensitive film is, of course, dependent upon proper lighting and its advantages over the old film have been intensified through the cooperation of the cameraman with the electrician. It requires less "juice" than the old film—which means a substantial saving to the studio in production cost—an important reason why every attempt will be made to bring out its virtues.

Two streets, one of them more than 500 feet long, recently were completed for production on the Paramount-Publix lot. In order to properly illuminate these streets which represent two of New York's well known thoroughfares, several hundred lamps will be employed, the majority of which will be Laco Lites, which type we have found meets the most exacting requirements of sound pictures as well as supersensitive film.

We adopted Lacos as standard equipment only after we had subjected them to severe tests, which resulted in our recent order for one hundred and twenty 18 inch and fifty 24 inch Laco Lites, augmenting our supply of Laco products to more than 520 units.

The electrical department in any studio today is called upon, on a minute's notice, to produce any number of lighting effects that come with modern treatment and modern picture production—and it is up to that department to meet those requirements with equipment that can fill the bill. For that reason the industry is more or less dependent upon those concerns whose endeavor it is to cope with the problems offered in picture production today. The fact that they keep abreast with the trend takes a great deal of worry, time and expense off our hands—as they maintain their own experimental department, and before their product is offered to the industry we are assured of its ability to meet our requirements.

In the adoption of Laco products, Paramount-Publix Corporation is confident that Laco Lite equipment has passed transitory and experimental stages—thereby minimizing cost to the studio—the conscientious desire of every studio technician.

New Boston Studio

A NEW organization has been formed in Boston, Mass., to produce commercial and educational pictures. A studio has been opened at 45 Broadway, and plans are under way for a laboratory. F. W. Adams is president.

Paper Film

A NEW type of film stock, made from paper, has been demonstrated recently in Paris. The film is very thin and transparent, and is quite free from fire hazard. Ozaphone, who produces it, claims that it can run 6000 times, and is so thin that 8,000 feet of it can be put in one spool box and be marketed at 50 centimes per meter.

Harry Perry Abroad

HARRY PERRY, A. S. C., has left for an extended trip through the Mediterranean. He is photographing a series of scenic pictures in Multicolor for Brown and Nagle—Educational release. He will be gone about six weeks. Perry had to fly from Los Angeles to New York to catch the boat. Improved his time enroute by photographing Grand Canyon from the air.

New Apparatus Exhibit

ONE of the features of the Spring Meeting of the Society of Motion Picture Engineers, which will be held in Hollywood next month, will be an exhibit of new motion picture equipment developed during the past year. The equipment will not be in the nature of a trade exhibit. Rules regulating the exhibits state that no pamphlets or advertising literature will be permitted. Each exhibitor will be permitted to display one small card giving the name of the manufacturing concern, and each equipment shall be labeled with a plain label free from the name of the manufacturer.

Excuse Us!

MUCH as Ye Editor hates to admit it, he committed a large-sized error in last month's issue. He announced that the stork had brought a DAUGHTER to Mr. and Mrs. Edward O. Blackburn. The genial Mr. Blackburn says the announcement was perfect except for the fact that it was a SON that the stork brought.

DuPont Negative

(Continued from Page 17)

ness. Light that does not reach film does not fog it. Under some operating conditions both on commercial and experimental scale total darkness is a considerable handicap. Practical experience has shown that, where extreme caution is used, a dim green safelight can be used, which will permit some vision and still not fog the film in exposures of a few minutes dura-

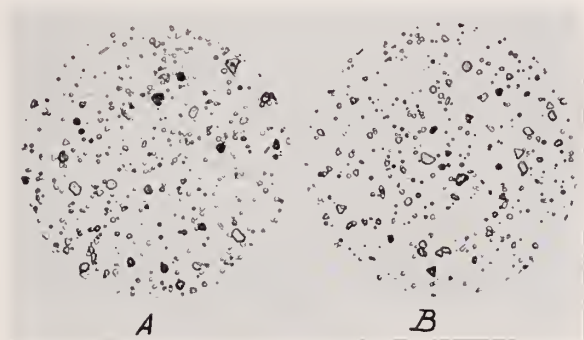


Fig. 3. Photo-micrographs of grains from DuPont panchromatic negatives.
A. Special
B. Regular

tion. No such light can be here successfully specified that will meet all working conditions. It is suggested, however, that where such light seems essential, dim green safelights be used and tested in place. Such a test can readily be made by exposing short lengths of the type of film to be handled in some simple holder such as a fold of black paper or cardboard which will expose part of the film to the light under test and protect part from that light. This may well be in the form of a slide such that the protecting cover may be moved back at specified time intervals, allowing a series of exposures on one piece of film. The threshold of fogging action can readily be determined in this manner with a minimum of time, film and effort. Developing such pieces of film will quickly show whether an exposure of any chosen duration at the selected position will or will not produce fog on it. Obviously no light can be judged safe when it fogs film in a time equal or less than the probable exposure of the film to it in processing. A factor of safety must always be considered to allow for a possible and probable variation in handling time. A second type of safety factor must be considered if light is used at more than one stage, since harmful additive exposures might occur to lights individually judged safe enough. All of these considerations should lead one to handle and process the film in total darkness unless the value of the presence of light is great enough to warrant adequate planning, testing and continued watchfulness in use.

Where it has seemed desirable to desensitize film to permit the use of an increased amount of light to watch development, the same procedure may still be used. The increased original speed of the Special negative may, in limiting cases, require the use of slightly less light after desensitization than could be used with the slower Regular negative, but in all tests made, desensitization of both was great enough to permit very satisfactory working light for development after desensitization.

With all of these facts in mind, the DuPont Special panchromatic negative is seen to require no change in technique of make up, taking and processing. In using it, all that is needed is to cut the lighting and go ahead in just the same way as with the Regular panchromatic negative.

German Returns to New York



William German

WILLIAM GERMAN, Vice-President and General Manager of J. E. Brulatur, Inc., has returned to New York after a brief stay in Hollywood. Mr. German came to Hollywood to supervise the introduction of the new Eastman Super Sensitive Panchromatic film. On leaving he expressed much satisfaction over the way the film had been received, fifteen pictures being in production with the new film being used.

Leigh Griffiths Heads R-K-O Mechanical Staff

LEIGH GRIFFITHS, formerly head of the Langley Field research laboratory, has been signed by Joseph I. Schnitzer to head the mechanical engineering staff of R-K-O. Griffiths will begin immediately on the designing of precision equipment for R-K-O's new Coast laboratory.

New Color Company Formed; Studio In L. I. City

OPTICOLOR CORP. has been formed to make and market a new three-color, additive process. Merrill Waide is president of the organization, which is operating at its studio, 4377 Vernon Ave., Long Island City. Backing the venture are T. W. Phillips of Butler, Pa. and Chester Breining, New York broker. The process involves a lens which may be attached to any standard projector.

Opticolor is also interested in a sound process for 16 mm. film.

Eight-Reel Commercial Being Made for Goodyear

AN EIGHT-REEL talking picture for the Goodyear Tire & Rubber Co. of Akron is nearing completion at the Detroit Sound Studios of Jam Handy Picture Service, according to John A. Freese, studio manager and director. This picture, "Every Third Wheel," is the first commercial of feature length to be recorded with the new Western Electric Noiseless Recording System. The greater part of the action was shot in the complete tire shops built inside the studios, although there are numerous exterior scenes, including views of the giant Goodyear Zeppelin dock at Akron.

It is understood that the completed picture will be shown at more than 150 points throughout the country to Goodyear dealers and their salesmen.

Filmo Abroad



Sir William Letts, K. B. E., was the guest of honor at a great war dance held at Johannesburg, and, of course, recorded the colorful ceremony with his Filmo. He is seen here talking with the dance leader just after the action had stopped.

Listen Laura!



HARRY MEYERS is in the midst of a graphic explanation, to Laura LaPlante, of the surprising features of the new Mole-Richardson Integral incandescent lamp. He tells her the Integral Inky is absolutely noiseless. In other words eliminates all cracking or popping noises when current is switched on. Miss LaPlante and Mr. Meyers are playing in "Meet the Wife," a Christie production, A. Leslie Pearce, director.

Theatre Test for 16 MM.

IN ORCHESTRA HALL, Chicago, recently a travel lecture by Burton Holmes was followed by an interesting demonstration of the Bell & Howell 16 mm. talkie reproducer, the Filmophone.

In this demonstration, it is stated, a new model Filmo projector unit, equipped with one of the recently perfected 375 watt lamps, threw perfectly clear pictures sixteen feet three inches wide on the screen, and the voice and musical accompaniment could be distinctly heard in the farthest corner of the big theatre which seats over 2500 people.

The size of the picture on the screen was determined by actual measurement, and the quality and volume of the sound accompaniment was tested in several parts of the hall, according to those present.

The test of the talkie outfit was staged by the Industrial Film Division of Burton Holmes Lectures, Inc., after the audience which had attended the Holmes lecture had left the hall, although Mr. Holmes and several of his friends remained to see the results of the demonstration. Naturally, the acoustics of the hall would have been improved by the presence of an audience, but even so, it is stated, the slightest sound from the record could be heard right up to the last seat in the hall. "In the top gallery," says Burton Depue of the Burton Holmes organization, "I could distinguish every word coming from the loud speaker on the stage, but for the life of me I could not tell where the speaker was located; it was too far away to be seen from this point."

The Filmophone was placed in the regular projection booth of the hall, over 90 feet from the stage, and a cord approximately 150 feet long was extended from the booth to the loud speaker. A regular two-inch lens was employed in the projector.

The volume of the sound accompaniment is reported to have been so great that it was unnecessary to advance the volume control to capacity.

It is the intention of Czechoslovak exhibitors to create a special sound-film group, with a view to protecting the interests of wired theatre owners, and to obtain the most favorable conditions for the purchase of sound-film reproduction equipment. This is following along the line adopted sometime ago in Great Britain.

New Color Device

ANOTHER new entrant into the color field is Rotocolor, an invention of Harold Muller of 160 West 45th Street, New York City. The new process, as reported, involves a shutter device attachable to any standard projector and which is quickly removable, allowing switching between black and white and color. The process does not concern laboratory processing of film. The inventor claims that his system is very inexpensive in comparison with other color systems.

Sound For Navy

SIX officers and fifty-six enlisted men of the United States Navy have been graduated in the first classes of the sound technician schools organized by RCA Photophone to instruct students in the operation of sound equipment soon to be installed on navy ships and at various stations.

New Laboratory Corp.

REPORT has it that Sol Lesser and Mike Rosenberg have parted company with Roy Davidge in the laboratory business. Davidge has incorporated under title of Davidge Film Laboratory, Ltd. Davidge plans to build a new structure on Santa Monica Boulevard. Work is slated to start within a month, according to report.

Paramount Adding Stage to New York Studios

PARAMOUNT officials have approved plans for a new stage to be built adjacent to the present New York studio. A heavy feature producing schedule, augmented by an ambitious shorts program, has made it necessary to provide more room. This annex, the latest of several added in the past two years, will be connected with the main building by an underground passageway.

Driving Off!



THE FIRST whack of Bobby Jones as a motion picture star. The world's greatest player of the ancient and royal game makes the drive that is his debut as a Warner Brothers' star in a series of golfing shorts. Director George Marshall is the gentleman in the link-side seat. A Mole-Richardson Mike Boom is taking the sound.

Amateur Movie Making

(Continued from Page 26)

use gilt, or bronze-surface stock for panchromatic film. For convenience and protection, put a light wooden frame around the reflector, and hinge a prop on the back which will support it while it is in use. Three of these, two soft and one hard, are sufficient for the amateur, although four, two of each kind, is ideal combination. Unless you have tried the use of reflectors you have no idea how much they will help. It takes but a little practice to become proficient in lining up reflectors on a subject, and the results are ample to justify the effort. They eliminate or lighten unpleasant shadows and enable the cinematographer to paint with sunlight, and the only cost is that of construction, for the sunlight is as free as the air.

Throw Light Five Miles

PROJECTION of light from a bulb only about five or six times larger than the ordinary tungsten lamp used in the home, so that a person five miles away is able to read a newspaper by its rays, was demonstrated recently.

The demonstration was conducted by W. A. Pennow, airport and airway lighting engineer with the Westinghouse Electric & Manufacturing Company at Cleveland, Ohio.

The light was projected from a searchlight throwing a narrow beam over Lake Erie. The beam spread only slightly over its course, Pennow explaining that the spread was only twelve feet a mile. Thrown on the clouds the searchlight produced a round spot that looked about as big as a washtub.

"The searchlight is designed principally to aid aviation in determining the height of cloud banks," Pennow said.

"The searchlight, containing a 420-watt lamp, produces 1,840,000 candlepower. Four per cent is lost every 5000 feet on a clear night. Light haze will absorb about 10 per cent a thousand feet. In heavy haze, the light can be seen a mile.

"Used in fighting fires, the searchlight can penetrate about every kind of smoke but the blackest pall."

Paramount's New Color Process

PARAMOUNT now has in preparation for next year a new three-color additive process which will cut color film costs to 4½ cents a foot, as compared with present price of 8½ cents. This process involves the use of ordinary black and white prints, with the color added by means of a filter mounted in front of the projector.

Filmo Topics

FILMO TOPICS, the Bell & Howell Company's monthly publication for users of 16 mm. cameras, has an excellent table of contents for the April number. This magazine may be obtained free by sending your request to that company at 1848 Larchmont Ave., Chicago, Ill. The April contents follow:

1. Taking Movies of Children.
2. Filming the Flappers. How a girls' summer camp director produced and used Filmo motion pictures.
3. Mr. Fuller and His Filmo Abroad. A traveler tells of filming Europe.
4. Filmo News Pictorial. News photos of Filmo owners.
5. Titling Your Films. No. 7 . . . Making "climbing" or "continuous strip" titles.
6. Gleaned from Here and There. A collection of ideas on movie technique from Filmo owners.
7. More About Projection Lamps.
8. Questions and Answers.

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attention

The pictorial section of the next volume of the Cinematographic Annual is being compiled. Anyone wishing to contribute prints for this section may send them in now for consideration.

Ground Noise Reduction

(Continued from Page 16)

Influence on Reproduction

Most reproduction from film is accomplished by interposing the recorded film between a source of light and a photoelectric cell. The intensity and amount of light may be considered as fixed, consequently any change in the opacity or width of the sound track as it passes through the light beam will cause a variation in the current through the photocell. The output of any given cell varies directly with the amount of light change and is independent of the rate of light change. This being true it makes no difference whatever to a photocell whether the light is cut off or varied by means of a sound track variation or by specks of dirt or foreign matter on the surface of the film.

You will be shown later what a variable area sound track looks like and will note, too, why we are not particularly interested in varying density. In normal variable area recording the sound track is always made up of equal portions of exposed and clear film.

Any dirt or foreign matter getting on the exposed or dark side of the track would have no effect whatever but should it get on to the clear side its presence would be noticed as noise in the reproduction. The reason for this is evident. Dirt is opaque and the dark side of the track is nearly so, but dirt on the clear portion would cause a change in the amount of light falling on the photocell and produce noise.

At the normal gain settings during reproduction, the ease with which wanted sounds can be heard depends on the ratio of the recorded sounds to the ground noise level. In other words, if the modulation during recording was low i. e.: of the order of say 10 or 15% and we accumulated a little noise from each of the sources mentioned a few minutes ago we would find it difficult to distinguish speech or music above the noise level.

Hanna-Hewlett Method

The problem then was how to drop the level of ground noise to a point where it no longer interfered with recorded sounds. Hanna and Hewlett did it by making opaque all that portion of the track not actually occupied by modulation. An obvious and simple solution wasn't it?

Their method was simple and effective too. They merely took a little of the output of the amplifier just before it was fed into the recording mechanism, amplified it, rectified it and used the resulting direct current to furnish what may be termed a secondary control over the vibrator. A detailed description of this method and the circuits involved will follow shortly so it will not be necessary to dwell at length on that point now.

What happens, however, is this. The output from an audio frequency amplifier is in the form of alternating current. The wave shape may or may not be symmetrical but in all cases the current values during any cycle start at zero, increase to a positive maximum, decrease through zero to a negative minimum and then increase again to zero. If these values be plotted and a straight line be drawn through the zero points, this line may be considered as a base line above and below which the current values rise and fall. In RCA Photophone recording this base line corresponds to the center line of our sound track when the vibrator is at rest in its normal position.

Since the vibrator is designed to change its position with respect to this base line under the application of current changes, its position at any instant is determined by the value of the current at that same instant. As the current rises to a positive maximum, the vibrator twists to an extreme position in one direction. As the current falls through zero and decreases to a negative minimum, so the vibrator twists back through normal to an extreme position in the opposite direction.

Suppose now that some direct current were introduced into this circuit. It would have the effect of shifting the base line about which the vibrations took place to a new position and

we would have a new zero line. Current changes and vibrator deflection with respect to the base line would remain the same as before but neither would be the same with respect to the new zero line.

It will be noted that the value of the d c from the rectifier placed across the output of the amplifier is at all times proportional to the strength of the a c signal so we here have an automatic and positive control over this d c component or "bias" if you will. In other words it is necessary only to choose first the new base line for the vibrator setting and second the proper value of the d c to return the vibrator to its heretofore normal position in the center of the sound track. Both are easily obtained and once set the ensuing action is simple, positive and automatic.

Applications of this principle have been made during the past year or more at R-K-O Studios and Pathe Studios, where a number of productions have been made and released.

The above paper is from the Technical Digest service of the Academy of Motion Picture Arts and Sciences. Another paper on the same subject, prepared by Hugh McDowell, Jr., of Radio Studios, will appear next month.—The EDITOR.

Screen Definition

(Continued from Page 15)

Regarding above cited examples, the red coat will show its proper density in the same balance as if the scene would have been taken without filter and standard panchromatic makeups are **not** affected by "Moore" filters.

The series of 20 filters established under this system starts with No. 0 which theoretically transmits no light and ends with No. 20 which theoretically transmits with a stop of f 2.7 as much light (in proper color balance) as the same lens would pass at a stop of f 9 without a filter.

The intervening filter numbers, gradually, not only increase in light transmission value from 1 to 19 but are individually compounded of such relative color and transmission values for the red and green components that a correct density balance is maintained.

In a previous issue the components for filters 1 to 6 have been given as selected from available Wratten filters. They produce with an f 2.7 stop less density than the same lens would produce with an f 9 stop.

For night effects this series is especially effective and the choice for either of them depends upon the existing illumination in order that necessary good contrasts are produced.

Beyond No. 6 these filters transmit sufficient light to reduce the contrasts below the value necessary for night effects.

They have, however, been proved very useful to produce soft tones to blue skies, to absorb such blue light as characteristic of hazy, dust- or moisture-laden atmosphere and to produce the characteristics of effective cloud formations and structures within themselves, even without the existence of the blue background.

Unfortunately the filter series beyond No. 6 cannot be compounded by Wratten filters but special red and green tone values must be used, which can in writing only be established by chemical formulae and minute description of relative proportions, methods of preparation and proper mixing control which would be of no value to the cameraman and therefore be beyond the limitations of this study, intended to contain as always useful disclosures of practical nature.

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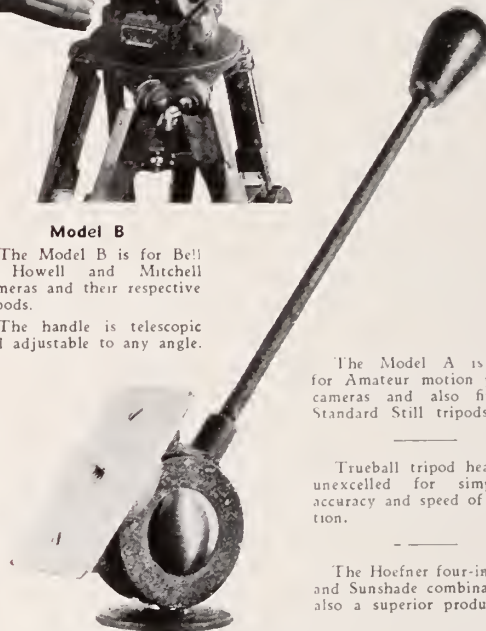


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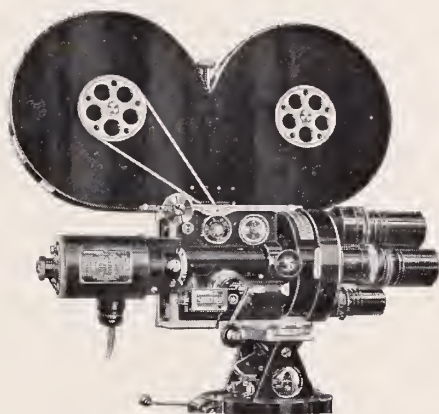
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Number 1

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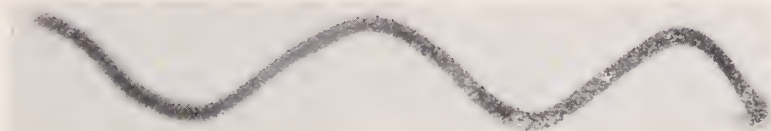
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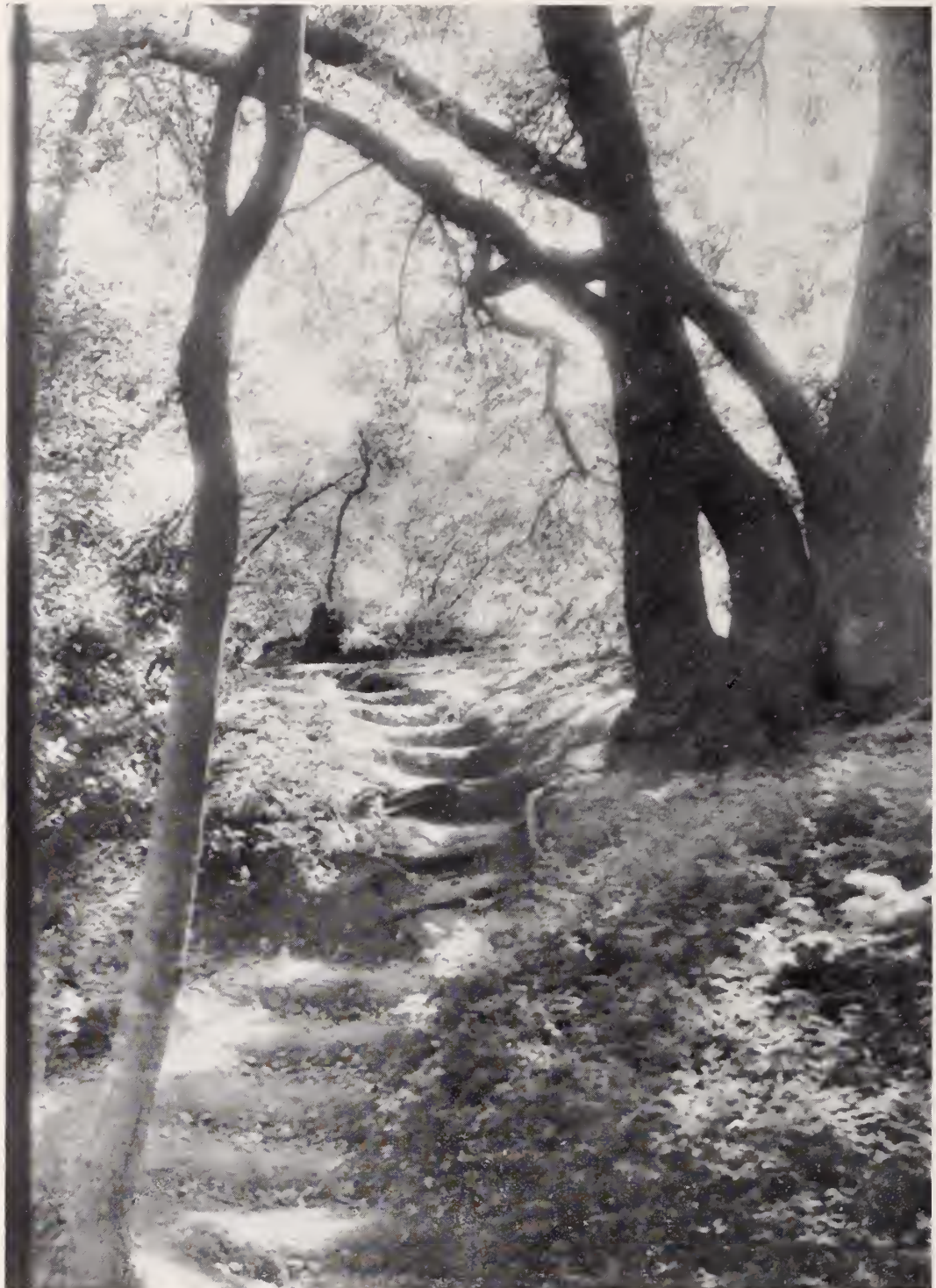
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The Trail

Jackson J. Rose, A. S. C.

John Arnold Elected President of American Society of Cinematographers

Three New Members Added to Board of Governors

by **HAL HALL**

JOHN ARNOLD, head of the camera department at the Metro-Goldwyn-Mayer Studios, was elected President of the American Society of Cinematographers at the annual election of officers of the society held on April thirteenth. Mr. Arnold succeeds Hal Mohr, who held the office for the past year.

Other officers elected were: Victor Milner, First Vice-president; John W. Boyle, Second Vice-president; A. L. Gilks, Third Vice-president; William Stull, Secretary; George Schneiderman, Treasurer. Mr. Milner and Mr. Stull held the same offices last year.

The new Board of Governors chosen by the society is the same as the previous year with the exception of three members: Gilbert Warrenton, Ray June and George Schneiderman. The complete Board chosen follows: John Arnold, John W. Boyle, Daniel B. Clark, Charles G. Clarke, Elmer Dyer, A. L. Gilks, Fred Jackman, Ray June, Victor Milner, Hal Mohr, George Schneiderman, John F. Seitz, William Stull, Ned Van Buren and Gilbert Warrenton.

The installation banquet was held on Monday evening, April twentieth, at the Uplifters Club, Santa Monica, with more than sixty members present. This meeting was one of the finest and most enthusiastic gatherings of A. S. C. men in years, and, judging from the enthusiasm displayed, the A. S. C.

is facing what should be the most successful year in its history.

Hal Mohr, retiring President, was master of ceremonies at the dinner. In his introductory remarks he reviewed briefly the events of the past year, and thanked the members for their splendid cooperation. He pointed out the remarkably healthy condition of the society and urged all to give the same cooperation to Mr. Arnold.

President Arnold gave great indication of being a truly splendid leader, for he presented no platform; declaring that in his belief the laying of a platform by a President is not the best policy because of the fact that most platforms cannot be carried out according to promises.

"I have no platform," said President Arnold. "Instead, I give you my solemn promise to work hard, sincerely and constantly for the good of the organization and of the cameramen. That is all one can do—work as hard and faithfully as possible. I have one aim—that is to make the American Society of Cinematographers an even still greater organization than it already is. We have a splendid society. We must not only keep it so, but must make it better; make its influence felt even more widely. The only way to accomplish this is for every one of us to give the best we have."

(Continued on Page 22)



John Arnold

The Principles of Sensitometry and Their Practical Application

by **EMERY HUSE**

West Coast Division Motion Picture Film Department, Eastman Kodak Company

[It is the intention of the technical editor, as author of this series of articles, to enter into a rather detailed discussion of the general principles of sensitometry. These principles will be stressed first, followed by a discussion of the applications of these principles as control elements in the motion picture field. Of course these principles apply to any branch of practical photography but as the motion picture field is probably the largest commercial photographic venture, it is here that the need of scientific control is strongly recognized. This is especially true in sound photography but the laboratory is also rapidly applying sensitometry to control all photographic phases of its work. It is hoped that such discussions will bring a new and better understanding of the technicalities underlying photography and will greatly clarify the minds of those to whom sensitometry seems a trick rather than one of the most valuable tools of photographic procedure.

Photographic literature is filled with books and articles covering the various principles of sensitometry and their application in practical photography. Most books of this type attempt to cover the entire photographic field and as a result there is no complete treatise of sensitometry that can be viewed in the light of a reference book. A serious attempt will be made to have this series of articles fill such a field.

Before entering into a discussion of the subject of sensitometry there are many preliminary items to be cleared up. The logical starting point must deal first with the historical aspects of photography, and secondly with the introduction and expansion of the basic principle underlying sensitometry as originally specified by Hurter and Driffield.—Editor's Note.]

Brief History of Photography

PROBABLY the first person to notice that silver salts were darkened by light was J. H. Schulze, who made the discovery in 1732. Undoubtedly others observed this phenomenon at about this same time. No photographic use was made of this discovery until about 1802 when Wedgewood published a paper entitled "An Account of a Method of Copying Paintings on Glass and on Making Profiles by the Agency of Light Upon Nitrate of Silver." Wedgewood conceived the idea of making silhouettes by using paper treated with silver nitrate. He also was one of the first to take photographs in the "camera obscura". The camera obscura consisted of a box with a lens at one end and a ground glass at the other. After focussing his image his prepared paper was substituted in place of the ground glass and photographic images were recorded. Very little success was achieved by this method due to the extremely low sensitivity of the photographic material. It was left to Sir Humphrey Davy, who continued Wedgewood's experiments, to more or less successfully make photographs using a microscope with the sun as the light source. These attempts of Davy's no doubt constitute the first picture made by means of a lens on a photographic material.

The difficulty in his method was that it was impossible to make the image permanent. It was quite some time later before fixation was discovered and along with it development. This work was advanced considerably by Fox Talbot in the middle of the nineteenth century and his work was succeeded later by the wet collodion process. In the meantime Niepce and Daguerre were working independently on various methods of recording photographic images. Later these two entered into a partnership and in 1839 published the method of photography which was named "Daguerreotype." This was really the first portrait process and became very popular. However, it was more or less a departure from the emulsion process of photography which is known and used generally today.

The collodion wet plate was made by dissolving nitrated cotton, such as is now used for the film base, in a mixture of

ether and alcohol. The worker of the wet collodion process had to make his own plates at the time when he wanted to take a picture. He would clean a piece of glass and coat it with the collodion in which the chemicals were dissolved and then put the plate in a bath of silver nitrate which formed silver iodide in the collodion film and made it sensitive to light. The plate had to be exposed while wet and immediately after exposure it was developed by pouring the developer over it. This process of course was filled with many difficulties and the making of a photograph was a very tedious task.

These difficulties disappeared with the coming of the gelatin emulsion process, which is in use today in all fields of photography. The gelatin solution with the silver is called an emulsion because of the way in which the silver remains suspended in the gelatin. The first gelatin emulsions were made in 1871 by Dr. Maddox. In those days all negatives were made on glass plates as that was the only medium on which it was conceived possible to coat the sensitive emulsion.

The discovery of film base came about somewhat by accident. After the invention of "stripping film," George Eastman continued his experiments trying to find a light flexible support for the emulsion to be used in place of the brittle and heavy glass. During his experiments he one day tried soluble cotton and wood alcohol as a varnish. This was very thick and like strained honey and Mr. Eastman knew at once that he had made his first step in the production of the long awaited base. Thus the present nitro-cellulose film base came into being in August, 1899, and amateur photography was born. This discovery made motion pictures possible.

Photography in the past decade has advanced materially, and has led up finally to the present day high quality Panchromatic Negative emulsions, together with Positive, Duplicating, and other special types of film emulsions.

(To be continued)

New Pacent Reproducer

STATING the company is ready to make immediate deliveries and that the average exhibitor will be able to save 20 per cent, Louis Gerard Pacent, president of Pacent Reproducer Corporation, announces the new series of "Z" reproducer, specially designed for smaller theatres. Among the series the double projector sound-on-film installation at \$1,695 is expected to be the most popular model.

In line with the company's outright policy no compulsory service charge is demanded. The apparatus is purchased outright at prices ranging from \$795 to \$2,295.

Prices include complete equipment, which is A. C. operated. Simple in operation without any complicated mechanism is one of the four important factors outlined by the company. Other relevant points are that the compact installation eliminates possibility of a bulky power plant, no dead-spots, no distorting horn speakers to disturb even sound distribution and no crackling noises and no fluttering sound in reproduction.

Super-Sensitive Film in Production

by **OLIVER MARSH, A. S. C.**

EVERYONE who is intimately connected with the technical side of the motion picture industry is agreed that the recent introduction of Super-Sensitive Panchromatic film is perhaps the greatest forward step in cinematographic technique since the introduction of the Incandescent light. In this they are quite right; anything that will aid the cinematographer in his effort to put the best possible picture on the screen is of vital importance to the industry as a whole, and the introduction of Super-Sensitive Panchromatic film has afforded him such a powerful means of bettering his work that its value is of fully as great importance as its most ardent advocates could desire.

But after having used this new film to photograph two successive productions—"Cheri Bibi" and "Dancing Partners" for Metro-Goldwyn-Mayer—it seems to me that all of us, technicians and laymen alike, have looked at this film from the wrong angle. We have stressed its greater sensitivity, or speed, far too much, and almost completely overlooked the fact that its greatest advantage is its immeasurably superior rendition of color.

After all, it is of relatively little importance to the studio cinematographer that it is some forty per cent more sensitive to light. Even in this period of hard times, no studio is going to be "saved" by a mere reduction of thirty-five or forty per cent in the quantity of current consumed in lighting its productions. Such a monetary saving is important, of course, but it is valueless if the quality of the picture which ultimately reaches the screens of the world is harmed. Therefore this new film is of merely minor importance if it brings only increased speed, without improvement in photographic quality. If it brings increased speed plus some improvement in quality, well and good. But if it brings not only a considerable increase in speed, but also a proportional increase in photographic quality, then truly is it a great advancement in cinematographic technique.

And this new film is exactly that. It gives an increase of some forty per cent in speed—which is by no means unimportant—and it gives an even greater improvement in photographic quality—which represents its real claim to importance for studio work. Speed alone is sometimes an advantage in studio production, but improved photographic quality is invariably of vital importance. And since the new Super-Sensitive film embodies both of these qualities to a high degree, it is of actual, practical value in our exacting work.

It is generally conceded that the best rendition of color is that which most closely approaches the natural visual brilliancy. The old Orthochromatic film distorted these relative values very badly, despite anything that we cinematographers could do with filters and careful arrangement of lights. We were satisfied with it because we had to be, since nothing better was available. Then came the first Panchromatic film. This was a memorable advance, for it allowed us to achieve a closer approximation of what we actually saw on the set. By the time that we were fairly well accustomed to using "Pan," along came the Mazda light, and an improved Panchromatic emulsion, the familiar "Type Two Pan." By this time, we have learned to use these new tools quite effectively, and our pictures bear witness to the fact that we are now getting quite good color rendition and tonal quality. But even this is noticeably short of perfection. Our blues no longer reach the screen as a muddy white, nor do our reds and greens photograph between a dark gray and black. Intermediate colors reproduce in a respectable range of half-tones. But they do not reach the screen with the same relative brilliancy that we actually see. We are still short of perfection.

With the new Super-Sensitive Panchromatic film, however, our cameras can now see things much as our eyes do. When the Art Department hands us a set to photograph, we know that we can now pass that set on to our audiences with its tonal values practically intact, though in monochrome. Our time and ingenuity will no longer be spent in an effort, with lights and filters, to prevent our films from distorting the tonal contrasts achieved by the Art-Directors and Costumers.

But to secure these advantages of tonal quality and color separation, we must make sure that they are first in the set, and that the sets are then lighted in a manner that will enhance these tonal contrasts. Many cinematographers who have tried the new film have overlooked the importance of these details, and have accordingly been disappointed with the flatness of their results. Too many of them have confused improved speed with exaggerated contrast. This is a grave injustice to a truly excellent film. It can not be expected to do something that it is not intended to do. Our aim today is natural tonal contrast with an artistic softness; but this softness can never be achieved by flat lighting. We can—and should—use a soft lighting, yes, but it should be normally balanced, sacrificing none of the tonal and physical contrasts which we wish to preserve, though keeping to a uniform degree of softness throughout. As a rule, we should work with a normally balanced lighting, taking pains to enhance the contrasts which we wish to preserve, and trust to the film not only for better color-separation, but for the desired softness, as well.

Of course, the less that is said about lighting, the better, for no two cinematographers work in quite the same manner. But one thing I must say: just because the new film is in the neighborhood of forty per cent faster, do not be deluded into altering the balance of your lighting. If you can make a forty per cent decrease in the total amount of current consumed on your set, well and good; you can save quite a bit of money that way, and the financial gentlemen in your company will hardly like you any less for it. But if you try to make this reduction in lighting at the expense of your natural balance, it will seriously effect the quality of your picture. Don't be deluded into trying to make this reduction in the number of units you use, for you've got to have a certain number of light-sources to preserve your balanced lighting: use smaller globes in your present equipment, and arrange things just as you always have. In that way you will be able to secure all the advantages of Super-Pan film without running the risk of the inevitable disappointments which attend its unintelligent use. You will find that the tonal quality, color-separation, and general gradation of your picture will be vastly improved, and with this improvement will come a surprising improvement in perspective. I have seen comparative tests, made with the same camera, lens, and set-up, but with Type Two Panchromatic and Super-Sensitive Panchromatic films, in which the difference in perspective was so marked as to make experienced cinematographers doubt that the same lens was used in both instances. But, above all things, remember that while cinematography has never been a task for the thoughtless workman, it is vastly less so now that we have so sensitive a tool as this new super-film; and the measure of the results obtained from Super Pan is exactly the measure of the care and thought put into its application to the problem in hand—getting the best and most natural picture in the most efficient way.

Practical Portable Sound Equipment

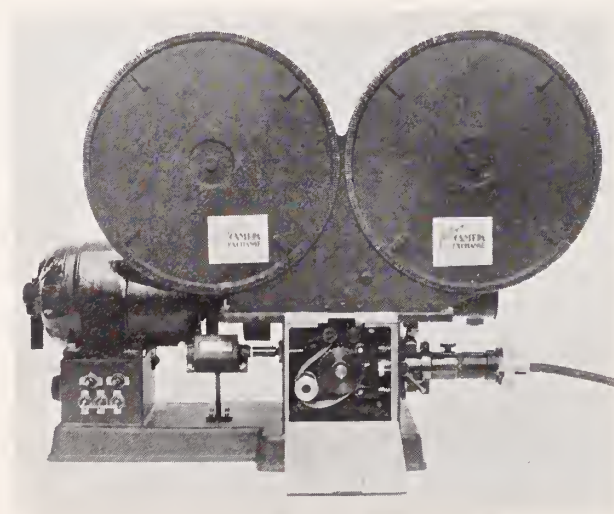
by **ARTHUR REEVES**

AFTER all the sound track is the thing. To get this result we must take into consideration many things, the recording and the development of the sound track. I could dwell an entire page upon the development of sound track. But at this time the most important thing is sound equipment. The two most important factors in the developing of the sound track is the light transmission of the track and the gamma which is the relation of the exposure to the contrast. The gamma is a term used in the measuring of the contrast of the sound track.



Figure 1

There are two systems of sound track recording in use today. One is the single system used by news reels and the double system that is used in the studios of Hollywood. The single system records the sound track simultaneously in the camera upon the same negative as the picture is being taken upon. The double system implies a sound camera running in synchronization with the picture camera. The sound camera, of course, uses positive film with which to record the sound. While the picture taking camera, as usual, uses the negative film.

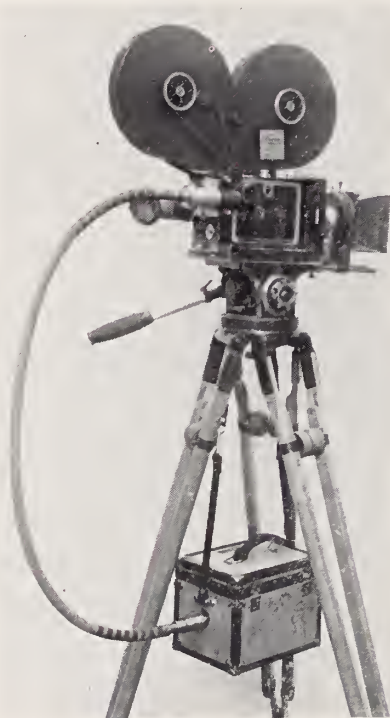


The Recorder

One of the most successful single systems in use today is the Fox Movietone and these cameras were specially built by the Wall Machine Works in Syracuse, New York, at a cost of approximately \$10,000.00 each. It has been understood that this cost was due to the accuracy that was demanded of this type of camera. It is almost impossible to rebuild a camera that will run absolutely accurately and have constant

motion. At this time there are none of our regular camera manufacturers making a special camera for sound recording. It has been rumored that one of our large camera manufacturers will put on the market in a short time a specially designed silent camera with a filtered sprocket for sound and will be specially adapted for the use of the single system. When this camera appears upon the market, the Audio-Camex will then put out a single system that will be worthy of its name.

The double system uses a separate recording head which was specially designed for sound work and runs with a constant motion giving a perfect sound track. The double system also gives the laboratory a chance to handle the sound track negative in the proper way. The double system also enables



The camera, showing mounting of D. C. interlock motor

the cutter to cut the picture and track separately. It also enables the making of sound separate from the camera and has many other uses. Every studio in Hollywood uses the double system.

The Audio-Camex, double system, consists of seven cases. These cases are metal covered with angle iron all around with strong construction. They are built to withstand the hard usage usually given to camera equipment. The cases are of the natural light color and reflect the heat which is necessary in hot weather. They also do not contain glue or leather as it is known that leather will mildew in humid climate, and in certain countries ants will eat glue. The empty cases alone are about one third of the total weight of the total equipment. In figure one, case No. 1 contains the camera motor, case No. 2 contains the camera motor battery, case No. 3 contains recorder motor battery, case No. 4 contains the

(Continued on Page 21)

Ground Noise Reduction

R-C-A Photophone System

by HUGH McDOWELL, Jr.

DURING the filming of the R-K-O production, "Hit the Deck," in September, 1929, musical effects were desired that would produce extremes in volume beyond the range of the normal variable area recording system. At this time, Mr. Carl Dreher, Director of Sound at R-K-O Studios, mentioned to the writer a system of recording by Mr. C. R. Hanna, of the Research Laboratory of the Westinghouse Electric & Manufacturing Company, for the purpose of eliminating ground noise and consequently permitting greater volume spread.

The writer was much impressed by the principle that Mr. Hanna had made use of, namely, eliminating the unused clear portion of the sound track in the variable area method of recording, and proposed further investigation. The objection was raised, however, that as this system displaced the position of the sound track at minimum modulation to the edge of the film, it was of doubtful utility in commercial projection machines, as any weave in the film in its travel might cause it to lose contact with the scanning beam during intervals of low modulation. The writer thereupon set about devising a system which would retain the advantages of Mr. Hanna's, but would keep the sound track at all times in the center of the seventy mils allotted to it on the film. The writer is also indebted to Mr. C. W. Hewlett, of the General Electric Company, for the use of a portion of his system which is similar to Mr. Hanna's.

Two Recording Essentials

Natural sound film recording must meet two essential requirements, namely, good quality of pickup, and range of sound from soft to loud with only a tolerable amount of noise. In standard methods of recording, the former is accomplished, while the latter is restricted to the limiting factor of ground noise caused by the unused clear portion of the emulsion on the film, admitting unnecessary light to the photoelectric cell of the reproducing equipment. As the light reaching the photocell is in effect the carrier of all current within the cell, it is evident that unused clear portions of the film cause the cell to produce energy not required by the legitimate sound, thereby producing extraneous noise in the output.

Noise is also produced by the transparent portion of the film not being totally clear, but containing dirt, scratches, etc., which disturb the carrier in such manner as to cause additional noise, in effect, reproducing the dirt, scratches, etc. It is obvious, therefore, that in the standard method of recording sound volume reaching the film must at all times be adequate to overcome the ground noise factor, which remains constant. This requirement restricts the compass of electrically reproduced music and is an obstacle to natural and effective reproduction.

The remedy for this condition in variable area recording is found in eliminating the clear portion of the film, except at times when the modulation requires it. With this accomplished, it is possible to allow the modulation to fall to its natural minimum and rise to its natural maximum, for with the clear portion of the film eliminated, ground noise no longer remains a constant quantity, but changes in proportion to the degrees of volume.

Roughly, in standard methods of recording, the volume range from minimum to maximum is approximately 20 db., while with the anti-ground noise methods of recording described herein, the volume range may be extended to approximately 35 db.

Electrical and Mechanical Design

The following description of the device does not take into account later simplifications in design.

Connected to the output of the recording amplifier is a two-stage amplifier of sufficient power to operate a rectifier tube following. The d c output from the rectifier is then passed on to a direct current amplifier which amplifies the d c impulses of the rectifier, increasing their amplitude to any desired point, by varying the input voltage on the two-stage amplifier. The d c impulses are then fed through one-half of a voice coil of an electro-dynamic shutter movement to a resistance and battery of low voltage which aids the flow of current from the plate circuit of the d c amplifier to ground. Across the aiding battery and ground is connected the remaining one-half of the voice coil which is excited by the aiding battery when the normal plate current is depressed, due to rectified modulation.

It is seen, therefore, that two voice coils in series in this manner are excited in such a way as to cause one coil to exert pressure, when excited, in one direction, while the other coil exerts an opposite pressure when excited in the other direction. This balanced circuit of voice coils in the magnetic field causes pressure to be exerted equally and oppositely in both directions, and in opposite phase. To these voice coils is directly attached a moving shutter actuated by the voice coils which is placed mechanically in the beam of light reflected by the vibrating element of the recording system. The shutter, therefore, moves in proportion to the amount of input to the two-stage amplifier, moving outward under pressure of the rectifier and voice coil to accommodate the peaks of the modulation on the film, and moving backward when the modulation decreases, also under pressure of the voice coil. It is obvious, then, that electromagnetic pressure is exerted in both directions in the functioning of the shutter.

The electromagnetic assembly is supported mechanically by a lathe carriage arrangement so that manual adjustments may be made to place the shutter in the proper position with respect to the light beam.

The vibration of the shutter is in exact accordance with the d c impulses of the rectifier, and, therefore, it admits light to the extent required by the peak modulation reaching the film at any given instant. When no modulation occurs, the shutter is adjusted to admit to the film light approximately five thousandths in width as against thirty-five thousandths width for the normal variable area recording system. It is seen by this that there remains about ten per cent of the clear portion of the film that formerly existed. This factor in turn admits only about ten per cent of the light formerly reaching the photo-electric cell in the projector, cutting down overall excitation of the photo-cell when no sound is in evidence, and consequently reducing extraneous disturbances in the cell.

Equipment Used

The equipment used in recording during 1930 consisted of a two-stage amplifier-rectifier and direct current amplifier built in a steel box 18x18x8, internally divided, the partition separating the d c amplifier, from the other units. The two-stage amplifier is operated from a small B-supply working from 50-cycle alternating current and supplying 250 volts to these stages. The direct current amplifier consisted of seven

(Continued on Page 44)

Sound and Speech in Silent Pictures

by **ARTHUR EDWIN KROWS**

THE voice that is now brought to the heretofore silent screen is not in itself a new expression, but a new aid to expression. That it enables the artist to approximate life more nearly is comparatively unimportant, because the purpose of art is not the precise imitation of life but its interpretation. The films of the future will not be any more original in essential thought because of the super-addition of voice than bygone silent pictures; but because of voice their expression will be more flexible.

The prime caution is never to think of the spoken word merely as sound. The voice makes a sound, but the word uttered may express the reverse of sound. For instance, the clerk of the court may call out in stentorian tones, "Silence." Or, going into other seeming contradictions, the well-known giant, muttering his "fe-fo-fi-fum," may continue, "I smell the blood of an Englishman." Or Gaffer Hexam (in *Our Mutual Friend*) may remark, as he steals a sixpence from a body floating on the Thames, that, "It feels cold and clammy and wet." Or the proud Balboa, extending his vision by poetic license from "a peak in Darien" to the Pacific Ocean, may utter raptures concerning what he sees. In short, the spoken word may easily appeal also to any of the five senses other than that of hearing.

So it is that the spoken word is usually, and perhaps quite invariably, a symbol for something else. It requires translation by the listener, whose imagination completes the suggested idea. It is that something else—whatever it may be—that measures the true effectiveness of the speech. Speech is the vehicle and not the end. The eloquence of Demosthenes, as that of Lincoln, was less in what he said than in what he literally thought. Thus it is that the expert stage dramatist writes his play not in words but in the ideas that the words are intended to convey—the reactions of the audience; and in this attitude of mind he is able to detach himself from the tyranny of words as such, and not use them at all if some of the other resources of his medium will at the given moment serve him better. In the theatre of today dialog is crisp and snappy in its interchange partly because the great alteration in living conditions demands a more telegraphic style, and more because many other factors have been developed to carry on the play. Shakespeare's stage was so meagerly equipped that the dialog had to state that the scene was a forest, a palace, a street—that it was day or night, and many more clues to circumstance that a random dip into any of his masterpieces will soon disclose. Nowadays scenery and lighting particularly relieve dialog of these unfair burdens and relate it far more nearly to every-day speech.

Talkie Lessons From Movie Titles

Strictly speaking, the strange new element is sound and not speech. Speech has been joined with motion pictures since their infancy in the shape of the printed "titles"—or "legends" or "captions"—upon the screen; and in the artistic sense speech of that sort is not much more second-hand than that which is directly spoken. As the word that is heard by the ear commonly has to be translated afterward by the brain as something other than sound, the printed word seen by the eye frequently also has to be translated because it has nothing to do with sight directly.

When the talkies permanently came, speech was already so far a part of motion picture practice that one-third of the footage of the average reel consisted of titles. Attempts had been made, every couple of years, to prove that the

motion picture art was in its zenith when a picture had no titles, among the interesting later productions of this sort being a version of James Whitcomb Riley's "The Old Swimmer's Hole," starring Charles Ray, and "The Last Laugh," starring Emil Jannings and directed by another superb artist, F. W. Murnau. But because speech, even in printed title form is so naturally and easily a part of motion picture appeal, its elimination upon such arbitrary grounds as provided by what here seems to be an over-nice and possibly mistaken artistic sense, has not been approved by the industry at large. On the contrary, titles have been pushed to the apparent limit of their expression, the records showing a wide variety of experiments to develop their effectiveness.

Experiments With Printed Speech

As many years ago as the heyday of the old Lubin Studio at Philadelphia, there was tried out a scheme whereby the witnesses in a courtroom scene gave their testimony in words double-exposed in dark areas over their heads on the actual picture. In a much later but now long-past feature called, if memory serves true, "Sporting Life," the action of the scene suddenly "froze," so to speak, and became a background of the printed title imposed over it—a method tried anew by George Loane Tucker in 1915-1916, when that gifted producer was director-general of the then recently organized Goldwyn Pictures Corporation.

The cut-and-try worker, urged to explain the abandonment of these devices, probably will say after brief reflection that mechanical delays entailed, and, above all, the item of translation for the foreign market, made them impractical. The fact lies deeper. They were given up because in effect they didn't seem right—the titles didn't "get over" as well as by the established plan of "cutting" them in. And whether those persons in the game divined the reason or not, it was this: the spectator appreciates best when he is able to concentrate; and his mind is so constituted that he concentrates best on one thing at a time. To watch the scene in the courtroom, however familiar it already may have become, to restudy the orientation of characters and their varying facial expressions and at the same time attend their speech presented in this fashion, was a little like dividing one's attention over a three-ring circus.

Now, of course, in the regular theatre one does not literally blot out the scene while he listens to the speech—and yet, if the production is carefully made, that is, in effect, what happens. As in concentrating on a word one is reading on a printed page he is also vaguely conscious of an area of printed text around the focal point, the engrossed audience listens to the player's telling words with a momentary dimming of the unrelated parts of the scene, the dimming being done by themselves. If attention is genuinely concentrated on the speech, the physical scene, to all intents and purposes, is not there save as one wishes to recall it. And what the venerable "cut-in" title does is artificially to assist such concentration by complete elimination of the scene for a brief interval. Thus, the universally used, traditional title was, in one respect at least, firmly rooted in approved psychology.

The stumbling-block here was the lack of uniformity in the audience itself. One person could read and appreciate quicker than another; and if he was not loud in his complaints that the title was held on the screen too long—in other words, that the scene was blotted out too long—the tenuous thread of interest snapped for him and he became restless. In this quandary the producers hit upon a device which was

to decorate the title background with something that would divert the eye that too quickly had exhausted the meaning of the lettering. Being specific about it, probably the first decorated titles were made about 1908 by Richard Klaussen, the artist for many years in charge of the title department for the old Vitagraph Company of America at Brooklyn, N. Y. They seem to have been re-invented independently a few years later at the Thomas H. Ince Studios in California, by Irvin V. Willat and Mon W. Randall, the former then a master-cameraman and the other an artist less celebrated than later for a highly original, vigorous technic. The Vitagraph Company had virtually abandoned the decorated title because there were too many other novelties to engage public attention for films; but early in 1915 the Ince picture, "Peggy," starring Billie Burke and with decorated titles throughout, was submitted to the distributors, Triangle Film Corporation, with a request for approval of the title backgrounds, in particular, that the practice might be continued for all Triangle-Ince releases. Approval readily given, the adornment became regular practice not only for the Ince division but for most of Triangle's competitors. Curiously enough it never was favored by D. W. Griffith, who at that time headed another division of Triangle. But the public liked it; and an even more potent reason for widespread adoption was the fact that it helped so much to "pretty" or "doll up" otherwise mediocre films.

In the half-dozen years following those in which workers in the first celebrated companies accepted and developed such basic advantages as the close-up, fade-back, double exposure, one-to-one shooting and shooting through scenes painted on glass, there was no organization that contributed more to picture technic than that at Culver City, California, dominated by the far-seeing genius of Thomas H. Ince. Hence the eager interest in title development of his chief of camera staff, Irvin Willat, was aided and abetted. Willat carried title decoration to its high-water mark represented by such achievements as one in a play of big city politics, starring William H. Thompson and Charles Ray, showing a living spider actually ensnaring a fly, and, more remarkably still, a tiny frieze with living figures acting out an allegorical prologue back of the opening titles of "A Gamble in Souls," starring William Desmond.

Finding Where Words Belong

These experiments were only incidental to other pioneer work which had to do with matters more fundamental than ingenuity of background. It was discovered, for instance, that titles should not anticipate action, which was precisely what had been learned about spoken words centuries earlier by stage folk. Of late years one has not seen much of the anticipatory title—that is, anticipatory in that sense; but in the first decade or so of the present century, it was one of the commonest technical sins. A title would read something like this—"Next day John Smith took his wife out driving;" and the succeeding picture-sequence would forthwith show John Smith doing precisely that thing, with the inevitable boring effect on the audience of having done it twice. The title should not "give the snap away"—should not, by telling too much, "take the edge off the story."

Then it was found, too, that the decorated title background slowed the tempo by inviting, without concentrating, further attention. The outcome here was that the best practice eschewed decorated backgrounds in all titles that belonged expressly to the pictorial action—"cut-in" titles, as they say—using them only for "editorial" titles leading up to action, or for those covering lapses between sequences or chapters of action. This explains the distinction drawn in the usual shooting script, of the silent picture days, between "titles" and "spoken titles." The former only were to be decorated.

Nor was this all. The title writer began to learn that the words were very definitely related to the pictorial action, and that writing one was by no means like composing a sentence

for a printed page. In Erich von Stroheim's interesting and in many respects notable picture "Foolish Wives," there was a "lapse-of-time" title something like this: "Night . . . music . . . women's voices . . . surf . . . fragrance . . . fireflies." No subject and predicate, no questions of syntax, no harrassing infinitives or metaphors—just those items of the "milieu" necessarily omitted by the silent picture and here supplied.

To the casual eye the title in its more advanced forms seemed more remarkable for what it left out than for what it said. Compression seemed the rule. One writer, Roy Summerville, on the scenario staff of old Triangle-Fine Arts, boasted occasionally that he was the first to use the three dots of elision to suggest the continuance of conversation not actually given on the screen; and there were other forms of editing words that forcibly reminded one of Henry Holt's famous advice to authors to practice their art by writing telegrams. There were also efforts to avoid the distractions of punctuation marks; and if Roy Summerville should go down to fame for three asterisks, the present writer may claim the innovation of "no periods at ends of titles." In William De Mille's production of "The Fast Set," made from Frederick Lonsdale's stage play "Spring Cleaning," even the usual quotation marks were cut from spoken titles. The reason back of all this is the same that applies to newspaper headlines where punctuation also is frowned upon. Nothing there is permitted to interfere with reading the full meaning at the first glance. And in spoken titles the word uttered "trippingly upon the tongue" is of high importance.

The title differs from the printed sentence in this other particular—there can be no turning back to read it again. It comes but once in the ideal telling of the story, and then in the most effective succession of bids for attention in which acting and scenery also figure. The title is now seen as essentially confirmatory of the pictorial action—a supplement to things literally seen. By and large this endorses and carries on a long-standing practice of the stage where speech interprets the gesture, gesture there being commonly made first. This order of precedence, that the gesture is before the speech, is psychologically based on two points—one that the eye is quicker than the ear, and that the spoken word, being oftenest a symbol of something other than mere sound, requires more interpretation.

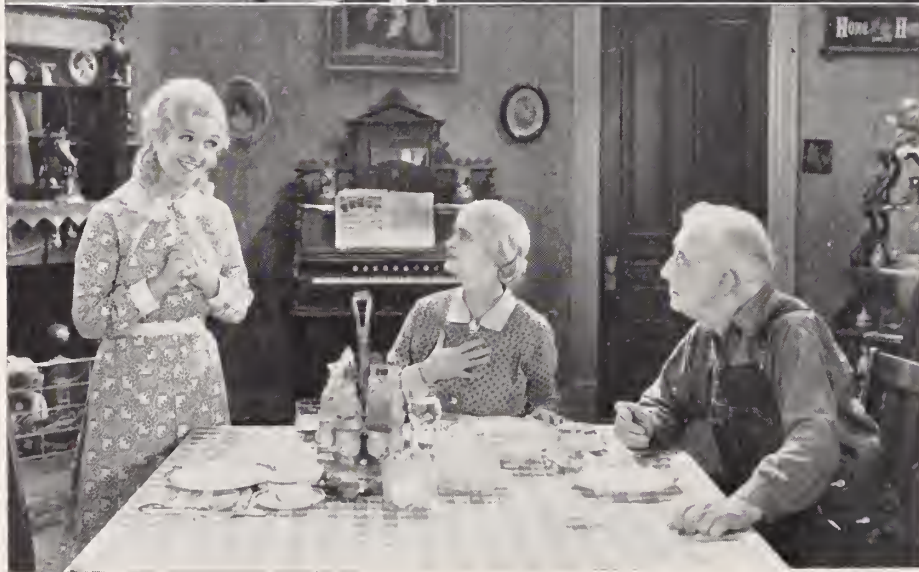
But with the coming of talkies it is observable that this is no final statement of the case. Words are generally secondary to the pictorial action; yet there are times when the words are quicker in point of time. Certainly it is more economical (to revert to a celebrated anecdote of Barrie and Granville-Barker), to say in words that one has "a red-headed brother who drinks port in Shropshire" than to try to show it altogether in pictures. There indubitably is a time when the spoken word, despite its familiar character as a symbol of something else, comes to the forefront as the most effective of the available means to the given end; and it is a very short-sighted director or continuity writer who does not seize upon it at that moment as a thoroughly legitimate means of artistic expression.

Perfection of the motion picture title has brought about an economy of words. This telegraphic character, however, is little more than has been attained by stage dialog, in which every phase is fraught with meaning to just that extent that it may be comfortably absorbed by the audience—not to do less with words but to do better. The tendency has been not to dispense with words, but to boil them down to elemental strength, just as the poet prunes and polishes his verse without meaning in the slightest degree that he is thereby relinquishing his verbal medium.

Sounds Beyond Words

Turning from the symbolism of speech, one sees that there is a power of pure sound, proverbial and known first-hand to

(Continued on Page 26)



Top, the three Moore brothers in "Stout Hearts and Willing Hands." Center, the Keystone Cops doing a "come-back." Bottom, Laura LaPlante, Mary Carr and Alec Francis in one of those heart-rending scenes.

The Keystone Cops Return

Masquers Bring Them Back in "Meller Mellerdrama"

by JOHN W. BOYLE, A. S. C.

IT IS NOT often, I'm sorry to say, that a cinematographer laughs so much on a set that he has difficulty in doing his work. The ordinary run of comedies thus far has not reached that point of perfection. As a matter of fact, comedies, generally speaking, are very serious things.

But, I have just finished photographing one that would make even the ex-King of Spain laugh if he saw it while on his way out of the country with a troop of Republican anti-Monarchists at his heels. And, did it bring back old memories of those golden days that have gone—those days of the distant past when sound tracks and super-speed film were not even thought of! I'll say it did!

When I walked onto the set the first day I could hardly believe my eyes. There I saw Ford Sterling, Chester Conklin, Mack Swain, Jimmy Finlayson, Hank Mann and Clyde Cook—the Keystone Cops—all in their old-time uniforms, trick mustaches and everything. It was like a flashback to the days when comedy was not comedy unless there was a flock of pies straying through the air in the general direction of someone's head; the days when the seat of a comedian's pants was intended for just one thing—a spot on which to plant the toe of a boot.

And, would you believe it, the name of the picture is "Stout Hearts and Willing Hands"; a picture that is a comedy, but is packed with the old "mellerdramer" as you never saw before. This picture is one of a series which the Masquers, Hollywood's "Lamb's Club", is making with which to raise funds to build a new club house. It is typical of the members of this wonderful organization to go out and work for the funds rather than to try to raise them by other methods. All talent in the series is volunteer. The first story was written by Al Austin and Walter Weems, and was directed by Bryan Foy. Two outside "willing hearts," Laura LaPlante and Mary Carr, add their bit to the members of the club in making the cast complete—and there are more stars in the cast than there are in the heavens.

Working with this group was a real joy. First the story was so funny. Then, the "asides" of the actors, in true old-fashioned style, were uproariously funny. At times, too funny for those of us who were trying to put it on the film.

I don't know which struck me the more forcibly, the all-around sportsmanship of Director Foy, or the general esprit-de-corps. Judging

from my experience, working for the Masquers, in the mind of a member, is like giving your all on a football team for old Harvard. Not a grumble although there were hours of waiting. Not a yip of disapproval if someone had funnier lines than the other. Not an expression of anything like jealousy if someone got more footage than the other. I'm telling you it was a joy to work with such a crowd. I can't understand how they went through their act without breaking down. There were Alec Francis and Mary Carr, the old folks with the mortgage, and Laura LaPlante, the "little Nell." Lew Cody, the villain holding the mortgage. Frank Fay as the "True-Blue Harold," an open-chested hero, if ever there was one.

Of course, there was the saloon with the three Moore boys as the bartenders. And if you don't know them, they put their names on their chests. You'll die when you see the hero ask for a glass of buttermilk to calm his nerves for a big play on the roulette table. And then, there is the sawmill where the circular saw threatens death to the hero, and of course, all ends happy with the villain out of the way.

But the kick to me was the return of the famous Keystone Cops, who jump to the alarm in the same fashion they did years ago in the old-time pictures. And how they jump! Even the Admiral of the United States Navy is called in—and he has an English accent. That's enough. You'll know why we laughed when you see it.

A remarkable group are the members of this Masquers club. They are an outstanding example of what cooperation will do in the picture industry. They need a new clubhouse. Times are hard. But they take advantage of these slow times when

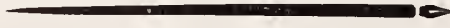
many of them are not working and put in their spare time in doing something that will bring them the house they want. That's using the head for more than a hat-rack. And—the way they plunged into the work a real joy to watch. A nice crowd to photograph, too, for none was trying to have better lighting or nicer closeups than the other. There was no star who frowned upon a bit player who seemed to be getting a bigger "break" than usual. All you had to do was make the best picture you could, and never think about the feelings of any player. You can shoot pictures when all you have to think of is the picture. But that's the way of the Masquers. Cooperation seems to be their watchword.



Mr. Boyle at the camera during the shooting of Masquers' picture. Franklin Pangborn is the "lady" in the foreground.

Hal Hall

S—A—Y—S



Thoughts In Passing

WONDER just what it's all about . . . Passed a street corner this morning and bought an apple from a poor, old woman whose gratitude at my nickel purchase fairly radiated from her wrinkled face . . . Came to the office and read where a movie star was kicking because her salary for the next three years would total but a measly one million dollars . . . Shucks . . . there must be something wrong . . . Friend of mine . . . nice, clean, industrious chap with wife and three babies came to me the other week to borrow ten dollars so he could get some groceries . . . The next Sunday I was in Caliente and watched a man lose six hundred dollars in five minutes in a crap game . . . that would buy a lot of groceries . . . Doesn't seem to be much happiness for anybody, anyhow . . . the poor are unhappy because they need so much . . . the rich are unhappy because they have so much to worry about . . . This writer can't figure out where he stands . . . but, sometimes we wish we were back on that old, rocky farm in Pennsylvania where we used to have a good time on Sunday just sitting and whittling on a piece of soft pine . . . Too much rushing about, going like the Devil and getting nowhere . . . matter of fact, most of us couldn't tell you where we're aiming, anyway . . .

Vision

THIS may be a far cry from the technical end of the motion picture business . . . but, did you ever stop to think what a big spot the dreamers play in this world. So often you hear someone say, "He's just a dreamer." They make a mistake, for a large part of the time the person they refer to is a man with God-given "vision." He is a man with an idea; a man with faith in that idea. And, those are the men who have made possible most of the great things of this world. Edison, Bell, Columbus, Fulton—they dreamed. They had faith. They gave the world something. Same in this picture industry. The men who in the beginning had the vision to see a future in the motion picture, and stuck to their dream, landed on top. If it had not been for them we would not have the picture of today.

Congratulations

MUCH credit must be given Joseph Walker, A. S. C., and Elmer Dyer, A. S. C., for the splendid cinematography in Columbia's picture "Dirigible." Mr. Walker was Chief Cinematographer and Mr. Dyer was the aerial cinematography specialist. The two gentlemen surely did an excellent piece of work, and again prove that the cinematographers of this industry are artists.

Tanar Catalogue

ONE of the most attractive catalogues that has come to our attention for some time is that of the Tanar Corporation, Hollywood manufacturers of portable recording equipment. This catalogue, consisting of 24 pages, is profusely illustrated and is gotten up in an unusually attractive color combination of red, green, black and buff, and is another indication of the progressiveness of this organization which in a year has made most unusual strides.

Musicals

JESSE LASKY says that Musicals are coming back. Thanks, Mr. Lasky. We always have liked musical comedy—when well done—and we hope your prediction is correct, for a good musical on the screen is a welcome relief from so many crook pictures. We hope that the various producers will use a little judgment when they do return, and not give us so many of them that we will be overstuffed. The trouble is that as soon as one company makes a picture that clicks, no matter what the type, all the others join the gold-rush and turn out similar pictures. But in their mad scramble to get in on what they think is the popular fancy, they neglect to give us good stories. That is the chief reason why the musicals went out as they did a while back. Too many of them—and too many bad ones. Wouldn't it be a marvelous thing if some company should make a successful picture and no other company would try to make one like it!

President Arnold

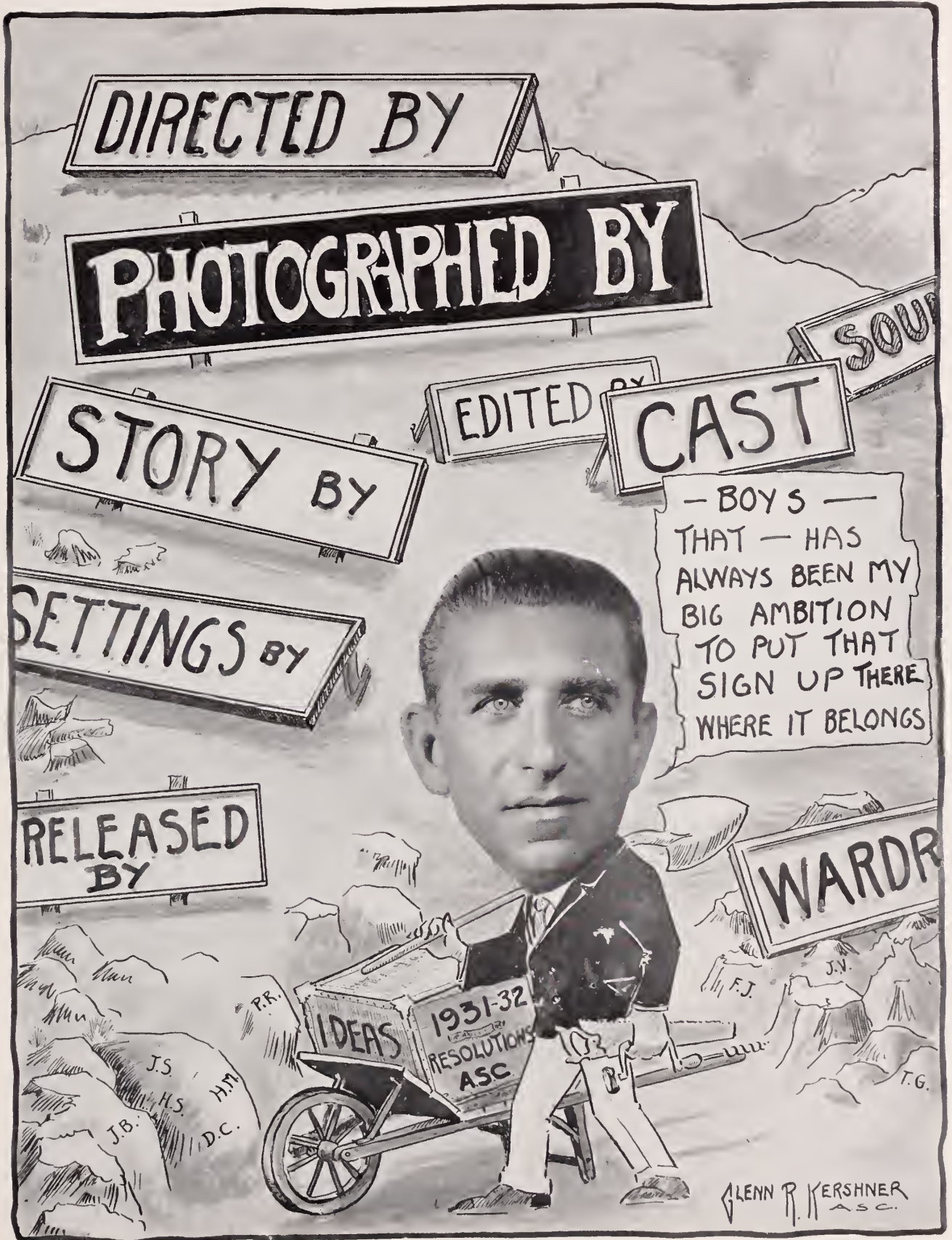
THE AMERICAN Society of Cinematographers is to be heartily congratulated upon the organization's selection of John Arnold as President. Mr. Arnold is a man of few words; but he is very strong on work and results. The fact that he has been with the Metro-Goldwyn-Mayer company for so many years is mute evidence of that fact, for picture companies are not prone to keep men in their employ for eighteen years.

Mr. Kershner's drawing on the opposite page is a splendid one, for it really portrays the real John Arnold—a man who works, and will continue to work for the benefit of the A. S. C. and every cameraman in the picture industry. Mr. Arnold believes the cameraman should be given greater recognition. He will work toward that end—and we predict that he will succeed.

This Month's Cover

THOSE of you who want to see a native daughter of California will kindly turn to the cover of this issue. There you will see Dorothy Revier, born in San Francisco. One of the few Californians to become a brilliant figure in the State's most famous industry—motion pictures.

Dorothy started out to be a dancer. In fact, she became a very excellent dancer. And then, seven years ago, someone saw her and figured she was screen material. They figured right. After a year of free-lance work, Dorothy was signed by Columbia. She stayed with them for six years. She and Columbia sort of grew up together in the picture industry, for her fame rose along with the fame of that picture organization which now takes no back seat for any company when it comes to turning out pictures that are entertaining and worthwhile. Dorothy has left Columbia now. She is again a free-lance. She just completed work in "The Black Camel" for Fox, and present indications point to a very rosy future for this native daughter of California.



President Arnold of the A. S. C. aims for Recognition for Cameramen

Laboratory Department

Conducted by EMERY HUSE, A. S. C.

Preservation of Motion Picture Film

FOR years before the nitro-cellulose base was generally adopted for the support on which photographic emulsions were coated, study was made of the preservation of negatives of which the emulsion was coated on glass. This early study of photographic images on glass proved that a silver image in gelatine would keep almost indefinitely, provided certain conditions in the manipulation were complied with.

The making of photographic images with an emulsion coated on nitro-cellulose base is more recent than the glass and paper processes and, as a consequence, there are not many records of long standing which may be considered as having established a comparison between the stability of film and glass photographic images.

Motion picture negative film having a nitro-cellulose base was first made in 1889 and as the emulsion was not then, nor for a considerable time afterward, as sensitive as the present emulsion, it was also used for printing positives until about 1895, when positive film was first manufactured commercially, though it was not until some years later that the use of either negative or positive film began to be of consequence.

However, during this period there had been an increasing demand for negative film in roll form for the making of snap shot negatives and as this film was basically the same as motion picture negative film and received the same general manipulation, we are able to form an opinion as to the comparative keeping qualities of film and glass negatives, except for such differences as might be affected by the customary method of storing glass plates and cut film negatives in special paper enclosures, whereas motion picture film has always been wound into a tight roll from which air is excluded.

As a result of the experience gained from the storage of negatives cut from rolls of film as used in the Kodak, which had been thoroughly fixed and washed, it is known that preservation over long periods of time is possible.

The constituent parts of motion picture film are a cellulose nitrate base and a gelatine coating which contains the silver image. The cellulose nitrate base consists chiefly of nitro-cotton and this substance, while apparently stable, is subject to a very slow change with time, while the gelatine containing the emulsion, if properly fixed, washed and dried, is absolutely permanent.

The change or deterioration in the nitro-cellulose base will be negligible if it is stored at a consistently low temperature, but more gradual if subjected to a high temperature, which causes the release of volatile substances which affects the physical properties of the base and is liable in time to attack the emulsion and gradually destroy the silver image.

On the other hand, insufficient fixing and failure to wash the film thoroughly to remove all traces of hypo will greatly accelerate this change and may result in a yellow discoloration of the gelatine coating. Furthermore, insufficient care in the processing manipulations combined with poor storage conditions of the finally processed film likewise causes trouble from the standpoint of film shrinkage.

When motion picture film is prepared for storage it should be wound on wooden cores, wrapped in chemically pure paper and placed in a sealed container, preferably of fibre or hard rubber, which in turn should be enclosed in a metal box, but

no metal should be permitted to come in direct contact with the film during the storage period.

In view of the effect of temperature on film base, the container should be stored in a cool but not too dry atmosphere, or such as would ordinarily prevail in a well constructed and properly ventilated film vault. Ideal conditions might be compared to the temperature ordinarily prevailing in a household refrigerator. Under such conditions there would be little to fear either from a change in the physical properties of the base or the gelatine coating or from the possibility of shrinkage to a degree which would affect the perforation pitch and cause difficulty in printing future positives.

The use of negatives for making reprints at intermittent periods has a beneficial effect as far as the stability goes, as this permits the escape of any small trace of gases which may have accumulated but under all circumstances, especially with negatives which are inactive for long periods, there should be careful examination by re-winding at least once a year, so that any change may be detected and the film copied, because once deterioration has started it is difficult to check it.

Waxing Prints

SOME film processing concerns so treat the prints that there is absolutely no trouble with film sticking or collecting on the tension shoes during the first couple of runs. But some prints seem to be coated with a substance that causes trouble for the projectionist.

The result is that tension shoes, sprockets and even the sound slit is filled with what seems to be a brown floor wax. During the first two or three runnings, especially with high intensity lamps this substance melts off and collects on the first cool surface it comes in contact with.

The result, one side of the intermittent sprocket piles up with wax until the tooth will hardly enter the sprocket hole and a wobbly picture on the screen is the result.

The application of this stuff is seldom equally applied and as a rule only one side of the sprocket is affected. After the sprocket has all it will hold the rest passes down to the take up sprocket and it fills up in turn, following which the slit in the sound gate gets a share with fatal results to the volume and quality of the sound.

The use of ordinary waxes of this kind for this purpose constitutes a fire hazard for, if the intermittent tooth fails to engage because of this clogging, the film is liable to stop in front of the aperture. Then fireworks with the amperage we carry today.

Get yourself a good stiff toothbrush and keep it on the starting box where it is easy to grab when you see the sprocket turn dark between the teeth. It will save you trouble.

Max B. Du Pont, A. S. C.
CINEMATOGRAPHER

on "SINGLE SIN"

HE. 1746

Portable Sound Equipment

(Continued from Page 12)

recorder, case No. 5 contains the amplifier, 3 audio lights, head phones, audio light cable, volume setting cable, extra tubes, case No. 6 contains the amplifier batteries, case No. 7 contains all the accessories that go to make a practical portable equipment. By practical equipment I mean instead of the usual 25 feet of very light cable, we give with the Audio-Camex system 200 feet of five wire shielded cable. This cable alone weighs about 60 pounds, but when you are away from Hollywood it is very hard to get extra cable. With this outfit we also use cannon connectors throughout. These connectors are the same standard connectors as used by the studios of Hollywood, and cause no trouble whatsoever and do not get out of working order. Our battery cases may be a little heavier than usual because we use a heavy duty battery believing that the best is none too good and the weight from the heavy duty battery more than pays for itself in the life and service given by a battery of this type.



The Audio Recording Light

When the idea of the portable double system was first thought of there was one obstacle in the way, and that was a method and means of synchronizing the motion picture camera with the sound recording head. The Audio-Camex engineers after much work and the aid of one of the largest motor manufacturers in the world completed a pair of direct current motors operating on B batteries interlocked and synchronized with each other. These motors were first announced in this magazine last October and were the first ones that were ever put on the market for any sound system. These motors run both as direct current motors but each makes its own alternating current on one end of the motor. And when the interlocking switch is thrown on, the alternating current running from both motors must stay in step or the motors will buck and not perform at all. The amplifier is so constructed that it will work in any climate or humidity and perform satisfactorily at all times. The main amplifier is impregnated in a catacomb filled with wax. It is a four stage direct coupled amplifier. It has a plate current meter and volume indicator. The plate current in each tube can be measured and one can tell if each tube is properly functioning. It has a two position mixer and will handle two microphones or it will also handle one microphone and a phonograph pickup, mixing phonograph record music with voice. The cable connections are all on the panel making it rigid and when the

cover is on the case there are no protruding connections whatsoever. It will be noticed all the connectors are of a different type, the microphone connections having five point connectors, the battery cable connectors being a six point, the audio light connector being a four point. It is, therefore, impossible to connect up the outfit the wrong way.



Amplifier Case

The bottom drawer of the amplifier case has a place for three audio lights, four extra tubes, a pair of head phones, audio light cable and volume indicator setting cable.

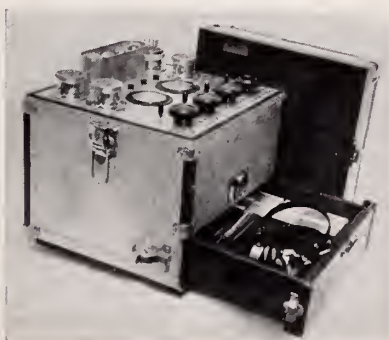
The audio light has a three prong base and will fit any standard radio c-x socket. This light is about one and one-eighth inches in diameter and about six inches long. It has a life from thirty thousand to a hundred thousand feet of film. One of the tubes being used here in Hollywood has already been used for one hundred and fifty thousand feet of film and is still in use. The life of a tube generally depends upon the amplifier and the matched impedance.



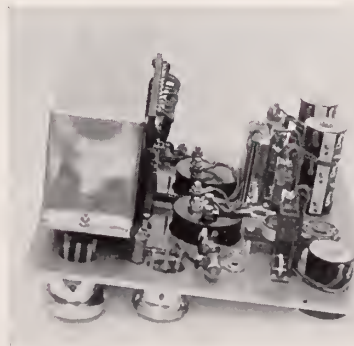
Bullet Type Microphone with cover removed

The recording head is specially built and designed for sound recording. Its construction is strong and sturdy and will stand considerable abuse without getting out of adjustment. It only consists of as few gears as possible to make it operate. The sprocket wheel is made to run absolutely accurate so there will be no flutter in the recording of sound at any time. In fact all good sound depends upon good motion in the sound camera. Our recording slit sits right close to the film and is a very unique construction and is made in such a way that the slit will not fill up with dust or dirt and at all times will record good track without having the modulation cut down by dirt and scratches.

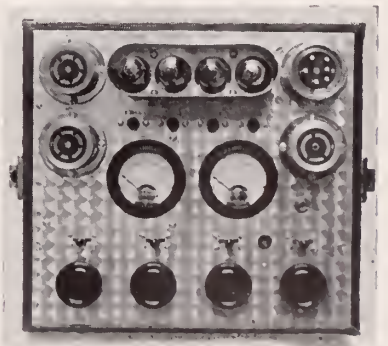
(Continued on Page 42)



Amplifier Unit



Interior of Amplifier



Amplifier Panel

John Arnold New President

(Continued from Page 9)

Among the other speakers were Past Presidents Dan Clark, John F. Seitz, John W. Boyle, Fred Jackman and James Van Trees. All spoke briefly concerning the aims and accomplishments of the society, and Mr. Jackman had the house in uproarious laughter by his reminiscences.

President Arnold was born in New York City, and it was there that he started his career as a cinematographer. It was back in 1908 that he "broke in" with the old Thomas Edison Company at Orange, New Jersey. From there he went to the American Mutoscope Company—lots of you may have forgotten those days—From Mutoscope he went with Rex Film Company. Then to International Film Company, Yankee Film Company, Atlas, World Film Company, Rayno, Columbia Photoplays and then to the famous old Biograph.

After a considerable stay with Biograph, Arnold entered the employ of the Rolph Photoplays. This was the organization controlled by B. H. Rolph who has long been out of pictures and whose famous orchestra is heard over the radio on the Lucky Strike Hour.

Then, in 1913, Mr. Arnold joined the Metro Pictures Corporation. It was not so large in those days, but through the years that concern by various mergers and reorganizations finally grew into the great Metro-Goldwyn-Mayer company which is one of the greatest of today. And through all the changes that took place during those eighteen years, John Arnold remained with the company as one of the outstanding cameramen of the industry. Executives came and went. New presidents passed in and out, but Arnold remained. Now he is head of the organization's camera department, and for some time has not been behind a camera. He holds a unique record with Metro-Goldwyn-Mayer because of the fact that, as far as can be learned, he is the only man in the production end of the company who was with it at the start eighteen years ago and still remains.

Mr. Arnold should prove to be an ideal leader for the society. He is a man who has little to say, believing that actions always speak more eloquently than words. He is a calm, cool thinker; a man with vision, but one who believes in being practical. In other words, he is the rare combination of a dreamer and a hard-headed man of action. Under his leadership the society should enjoy a year of great success.

Mr. Milner, First Vice-president, is one of the industry's most outstanding cinematographers, and no more able man could have been chosen for this office. For years he has photographed some of the greatest pictures that Paramount has presented. The strength of any organization lies in its reserves; and in Mr. Milner the society has a man admirably fitted to take over the leadership if it should become necessary.

Mr. Boyle, Second Vice-president, is another admirable officer. He served one term as President, and brings to the society the experience so gained. To the writer, the society uses excellent judgment in placing former Presidents in office. Incidentally, it shows the real bigness of a man who has once been President if he accepts another office in later years. Mr. Boyle is another man whose cinematographic ability needs no introduction. For years he has been one of Hollywood's best.

In selecting Mr. Gilks as Third Vice-president the society again has shown fine judgment, for he is not only one of the best cinematographers in the industry, but is a man of keen business sense and a man who has the quality of leadership so necessary.

Mr. Stull did such an excellent job of handling the office of Secretary last year that he was, quite naturally, unanimously chosen to serve again. A tireless worker and a stickler for detail, Mr. Stull stands out as one of the finest Secretaries the society has ever had.

Mr. Schneiderman is not a stranger in the position of Treasurer, for he held the same office some years ago, and was such an able man that his selection this year when Mr. Arnold left the treasurership to become President was a foregone conclusion. Incidentally, Mr. Schneiderman is another of the industry's great cinematographers, for years being one of the biggest men in his field with the Fox organization.

With such a group of officers, the society has nothing to fear for the future.

The annual report of the society, presented at the close of the past year, revealed the fact that the society is in the healthiest condition of its history. Despite the period of depression, the magazine has forged ahead and the Cinematographic Annual successfully weathered the storm of its first appearance, and gives promise of being still greater in its second volume, publication date of which has not yet been announced.

The following committees have been appointed for the coming year:

Public Relations—John Arnold, chairman, Joseph Dubray, Georges Benoit, H. T. Cowling, Claude McDonnell, Harold Sintzenich, E. L. Dyer, Ariel Varzes, Frank Zucker, Claude C. Carter, Charles Bell.

Research and Education—John F. Seitz, Joseph Dubray, Emery Huse.

Membership—Fred Jackman and Daniel B. Clark.

Production—Daniel B. Clark.

Social and Entertainment—Hal Mohr, Frank Good and Gilbert Warrenton.

Program and Exhibition—Ray June, Elmer Dyer and Hatto Tappenbeck.

Board of Editors—Gilbert Warrenton, Wm. Stull, Joseph Dubray, H. T. Cowling, Ned Van Buren, George Schneiderman and Hatto Tappenbeck.

Cameramen Want Silence

SIXTY FIRST cameramen, representing all Hollywood studios replied to the questionnaire on camera silencing sent out in March. 91 percent of the replies advocate strong efforts toward the development of cameras which would not require blimps or covers of any sort. 52 percent of these replies urged such efforts in strong terms.

The weight of the blimps in use was condemned by 90 percent of the replies; the bulk by 87 percent. 55 percent said the blimps made focusing difficult and 73 percent said they crowded the sets uncomfortably on close-ups. Practically every type of camera cover in use in Hollywood was criticized for one or more of these reasons.

At the meeting of the Producers-Technicians Committee April 16th, it was resolved to bring this situation to the attention of the camera manufacturers and inquire what efforts are being made toward the production of a silent camera. The Committee will offer to have studio experts confer with the manufacturers in an endeavor to advance such efforts.

The Committee expressed its appreciation of the cooperation of the American Society of Cinematographers, and of the International Photographers of the Motion Picture Industries (Local 659 of the I. A. T. S. E. and M. P. M. O.).

The questionnaire also inquired the effects of directional microphone devices (concentrators, ribbon microphones, etc.), and also of "noiseless recording" systems. The replies, however, revealed that too few cameramen have worked with any of these devices to permit generalization as to their effects. Several leading cameramen expressed the opinion that the development of adequate concentrators would reduce the importance of silencing the camera. On the other hand, the recording systems which eliminate ground noise make incidental noises, as from cameras, more noticeable.

A REMARKABLE NEGATIVE FILM

Now you can have from two to three times the speed of ordinary negative, especially under Mazda lights . . . greater exposure and developing latitude . . . unexcelled color balance . . . every other quality essential to the finest sound pictures, including typical Eastman uniformity . . . at no increase in cost. Every test, in the laboratory, in the studio, on the lot, confirms the belief that Eastman *Super-Sensitive* Panchromatic Negative, *Type 2*, is the most remarkable negative emulsion ever offered the camera man. Eastman Kodak Company, Rochester, New York. (J. E. Brulatour, Inc., Distributors, New York, Chicago, Hollywood.)

EASTMAN *SUPER-SENSITIVE*
Panchromatic Negative, *Type 2*

INTRODUCING A NEW LAMP

...AND ITS SIGNIFICANCE TO YOU

NOW another General Electric product—the Photoflash lamp—eliminates the smell, smoke and noise of flashlight powder. Already it is in wide use among press, commercial and professional photographers generally.

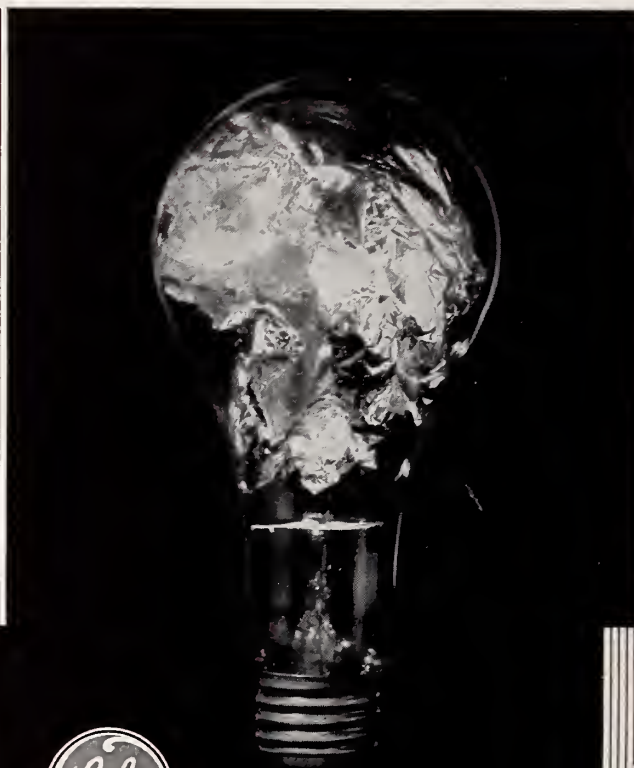
The lamp itself is simple enough, both in construction and operation. Thin aluminum foil in crumpled sheet form, pure oxygen and a specially coated filament are the contents of the clear glass bulb, which has the usual medium screw base. When the current—which may be that supplied by A.C. or D.C. circuit or by dry-cell or storage battery—is applied, a brilliant flash of white light which lasts only 1/50 second occurs.


The lamp is used with suitable reflector equipment for best results. One lamp amply illuminates small areas with few subjects, while several lamps can be flashed simultaneously for larger groups.

The General Electric Photoflash MAZDA lamp is assured a definite place in the cinema industry. The creation of artificial silent lightning is one of many

uses that suggest themselves at once.

In still photography, Photoflash will be used extensively in publicity shots in the homes of film stars, where its cleanliness, convenience and efficiency will be welcome. Wherever flashlight shots are desired—in public places, on boats, trains, in hotels—the G. E. Photoflash MAZDA lamp will make them their best.





PHOTOFLASH
MAZDA LAMP

GENERAL ELECTRIC

*Join us in the General Electric radio program
broadcast every Saturday evening over a
nation-wide N. B. C. network.*

Var god omtala den Cinematographer in skrivning till annonser.

Announcement Extraordinary No. 2

The Moreno - Snyder Continuous Camera Is a Fact

In the American Cinematographer for November, 1930, we announced that the camera (and projector) was in process of manufacture and that it would soon be ready. Delays were caused by the addition of important new devices invented by Mr. Moreno.

Well, here it is—the camera that wise ones said could not be successfully fabricated—and by test it looms as the ideal precision instrument in its field.

It is offered to the trade on its merits and here are some of them:

CONTINUOUS. The film passes through the camera at continuously uniform speed with no intermittent motion on either the film or any moving part of the camera.

NOISELESS. This fundamental kinematic characteristic permits of a design which is noiseless in operation.

EXPOSURE TIME. At the now standard intermittent film speed of 90 feet per minute the exposure time per picture frame is 1/48 seconds. With the M. S. Camera, and at a continuous film speed of 90 feet per minute, the exposure time per picture frame is about twice as long or 1/24 seconds. Result: Standard exposure with M. S. camera is obtained by about 50% of now necessary standard illumination or of working lens aperture, thereby increasing photographic values of picture.

SLOW MOTION. This camera is without any necessary change of adjustment a silent "slow motion" camera up to a film speed of about 300 frames per second or 1125 feet per minute.

SOUND RECORDING. On account of the continuously uniform progress of the film synchronized sound recording can be effected at the corresponding picture frames and not a predetermined distance therefrom—another decided advantage over present standard practices for sound on film methods.

COLOR PHOTOGRAPHY. The increased exposure time for standard film speed offers great advantages for any system of color photography.

DEPTH OF FOCUS. Another desirable characteristic of the M. S. Camera is the fact that a greater depth of focus is obtained for any definite setting of any standard lens.

FOCUSING DEVICE. The change of camera from focusing (finder) position to exposure position does not move any heavy part of the camera; but is effected by the jarless and practically resistless moving of a small lever for about 1/4". The photographic lens and the film are untouched, therefore, no movement of any kind is required.

MAGAZINES. Delivery and windup film magazines are separate from each other, permitting about 50% reduction in weight and bulk of handling of camera film supply.

CONVENIENCE. The M. S. Camera is lighter than most professional cameras, is easy to set up and its silence makes it a boon to the news men.

EXPOSOMETER. The handiest device ever installed on a camera; at a glance the cameraman is able to determine the correct intensity of light and exposure. This means standardization of negative density—enables the operator at will to absolutely duplicate any predetermined lighting condition.

TRICK WORK. For trick work alone the M. S. Camera is worth more than its cost. Its steadiness is amazing and its continuous movement enables it to do wonderful things.

Our next announcement will concern itself with color photography and projectors. Our illustrated folder will, within the next two weeks, be sent to all inquirers.

MORENO - SNYDER CINE CORPORATION, Ltd.

6250 Santa Monica Blvd. and 1072 Vine St., Hollywood, California
Phones - Office GR-0306 - Shops GR-5277

Gabriel Garcia Moreno, Chief Engineer

William G. Fairbank, President

Silas Edgar Snyder, Vice-President, in charge of Sales Promotion

Sound and Speech

(Continued from Page 15)

all music-lovers. There is the force of rhythm, used so effectively in the incessant beating of tom-toms off-stage in Austin Strong's celebrated play, "The Drums of Oude," or even more closely knit into the plot of an early sound picture, "The Dangerous Woman," with Milton Sills and Baclanova, where the savage ceremonies of an African tribe stir the sensuous nature of a white woman till she becomes a vampire. But even music tries mostly to express more than sound. One composition is "The Awakening of Spring." Another is "The March of the Wooden Soldiers." Still another is "The Moonlight Sonata." Virtually all are interpretative of things other than what "delights the ear" alone.

And yet even pure sound is not altogether new to the makers of titles. For many years they have been underscoring words for emphasis, or having the words appear successively upon the screen in imitation of staccato utterance, or having speeches run in criss-cross to approximate the chatter of gossips, or having significant words like "War" and "Murder" and "Help!" grow from nothing till they fill the field, or having the cry "Police!" or "Fire!" in quivering letters, or having dialects suggested with occasional misspellings. Borrowings from the fine practice of typography have long given biblical utterances in the ecclesiastical black letter or "Old English," and growing discernment has uncovered the force that lies in delicate faces of type for plays of fragile sentiment, and more vigorous forms for virile stories. There has come about, it must be added, an all-around but peculiar style of lettering for titles that the type-founders have done the reciprocal compliment of casting in fonts. It is a generally round, open-faced letter, with heavy serifs, easy to produce and to read and not seriously modified by varying laboratory developments of the film upon which it is used.

Quite naturally it will be some time before the industry as a whole realizes the true affinity of motion picture titles and uttered speech—naturally because in any radical departure, in art as in politics, the first overwhelming tendency is to throw out everything old—pack and baggage. Nevertheless, and this should be clear by now, there are valuable benefits from the old to be cherished and enjoyed. So, before dispensing utterly with the long-serving title, its various forms should be scrutinized, each in complete detachment from the others, to see precisely what it has to give.

The Playwright Speaks

One common form of title, long accepted on the screen, will seem quite unadaptable, and that is the editorial title in which the maker of the picture makes observations in his own person, without the intervening medium of any character. This title may say no more than "Dawn" or "Night" or "Home;" but it clearly is the injected comment of an outsider who is assumed, by the author's own terms, to be absent.

Here, once again, it is easy for the purist in art to be over-nice in his discrimination. The editorial title has too many valuable uses to be abandoned just because the body of the picture is literally spoken. The opportunity to whisper, in a manner of speaking, into the spectator's ear, supplying him with just the right expression with which to describe and remember his moment of ecstasy, is rich in possibilities and no more illegitimate than the strains of music out of nowhere that are injected occasionally to build up the emotion of the scene. But there is a more virile function of the editorial title; and that is its service between chapters or sequences of action, bridging intervals of time or saving the periods of rest between intense emotional experiences from being gaps so great that the flow of interest falls through.

From time to time in the regular theatre the printed program has essayed this same last-named service, summarizing the preceding act and speculating, with rich promises of future pleasures, on the action to come; so there is an analogy. But

the stage could never hope, in circumstances where the program is only occasionally read and then usually at inappropriate times, to attain the development of this device reached by the screen where everyone who attends the play must also, perforce, attend the title.

Another proof is here of the truth that the possibilities of an art are realized best in the direction of its handicaps, and that its greatest weaknesses lie in what it finds easiest to do. When the printed program was first added to the facilities of the theatre, theatre folk frequently put into it important links in the plot not otherwise obtainable. In course of time, however, misuses were curbed; and today the theatre program is a mere list of players (found with difficulty in a farrago of advertising). For the fact is seen that, with a little ingenuity and patience, what the program gives so easily may be better given in the play itself. The time and place, the character names and identities and much more, are now "put across" by the action itself as it moves along.

In this respect the talking pictures are following the stage example. They are tending to dispense utterly with printed descriptive matter once the play has started. The "iris out" and "iris in" shut off one scene and disclose another just the same, to all intents and purposes, as the stage curtain; and the characters in the second scene serve to tell how long the interval has been since the first and to what new place the audience has been transported. But however much better this practice may seem, the picture folk should not debar themselves wholly from advantages of the printed word. There indubitably are cases wherein a simple printed statement of the fact is far preferable to a strained expression of it by characters who would not reasonably do it, and the time for doing which throws the whole composition out of balance.

Of course it all depends on the circumstances. The artist's good taste and fine discrimination must prevail. The great objection to the editorial title is that it is the utterance of a person outside the story and therefore tends to break the spell of the play. Well, if the artist is an artist, he will know when he may resort to this expedient and when he should not. He will know that even in moments of great dramatic stress it is sometimes not only possible but tremendously effective to put the reaction of the audience into words, or to help them to feel the reaction by articulating it for them. He will have less compunction about using the editorial title between "iris in" and "iris out" because at that time, as in the stage intermission, the spell of complete absorption has already been broken, the audience is once more aware that it is in a theatre and grateful for the opportunity to recapitulate and reflect, and the editorial title may greatly assist their state of mind. Indeed, when intermissions between chapters, sequences, or acts are as brief as they are in screen practice, a predigested opinion of the case that has gone before, with the prospect of what is to come, may easily be essential to spectators who have had insufficient time in which to work out matters for themselves.

It was found long ago that even films must have intermissions. The stage intermission, popularly supposed to be due to the necessity of changing scenes, is really for rest and thought; and when so-called "super-features" began playing for the then supposedly unattainable two-dollar price on Broadway and appeared in about eighteen or twenty reels each to give money's worth, it was found necessary to full appreciation to break performance in the middle and give the patrons a quarter-hour or so to move around.

As said before, the important working habit of mind is to appreciate verbal and printed speech for what they really are, without prejudice, and to employ them freely where they serve best. Out of this attitude will come the new art of talking pictures.

[This article, written by Mr. Krows of the Electrical Research Products, Inc., is printed here through the courtesy of the S. M. P. E. Journal and Henry Holt & Co., publishers of "The Talkies," of which this is a chapter.—Editor's Note].

.. In the Realm of Sound ..

Noiseless Test Film Developed By Erpi

by T. L. DOWEY

Engineering Department, Electrical Research Products

ELECTRICAL Research Products has always considered it a matter of prime importance that its installations should be so maintained that any noise accompanying sound reproduction was kept at a minimum, and certainly below the level at which such interference would become noticeable. With the introduction of Western Electric New Process Noiseless Recording, this requirement became more important than ever, as the benefit of the new recording is, of course, lost unless there is practically complete absence of noise from the theatre sound system.

In order to make a dependable operating test on a sound reproducing equipment, it is necessary to have available, for Service Engineers and Inspectors, sound recordings which are known to be good and which are sufficiently varied in character to test the capability of the equipment for properly reproducing various kinds of sound. For the purpose of testing film sound reproducing equipment in this way, Electrical Research Products has made a practice of using standard test films. These have, of course, been remade and improved from time to time to keep pace with the progress of the art. The type now being brought into use is made by noiseless recording, so that it can be used to test the fitness of a sound reproducing system to handle sound pictures made by the new method.

This newest form of test film has no picture but has two sound tracks, one including voice and music selections, and the other including several constant frequency sections, ranging from 55 to 8,000 cycles, and a length of unmodulated, that is, blank track for ground noise measurements.

The film serves a double purpose: first, it may be used to make a check of the general quality of reproduction by use of the track having the mixed voice and music recordings; second, it permits the frequency characteristics of a system to be determined by using the other track in conjunction with a volume indicator.

The presence of "flutter" may be detected by listening to the sustained notes of the singing and piano selections and to the constant frequency recordings.

High frequency loss may be detected by listening to the high notes of the piano, violin and orchestral selections, and especially to the voice sibilance which should be present in the talking and singing selections.

Low frequency reproduction may be checked by listening to the naturalness of the talking and singing selections and to the drum section of the orchestral selection. The bass notes of the piano selection will also sound unnatural if the lower frequencies are attenuated.

The two sound tracks are recorded from opposite ends of the film, so that when one sound track has been played, the reel on which the film has been taken up can be simply placed in the upper magazine and the film run through in the opposite direction, eliminating the necessity for rewinding.

It will be evident from the foregoing that a test film such as this must constitute a very valuable standard of comparison for determining whether any given installation is capable of affording sound reproduction of the high quality now essential.

New W. E. Photoelectric Cell Shows Advances

THE NEW 3-A photoelectric cell, recently announced by Electrical Research Products, offers another example of the constant improvement being made in Western Electric sound picture equipment.

The first cell to be used in Western Electric Sound System was the 1-A cell. This was replaced by the 2-A which embodied structural improvements over the 1-A. The 2-A now is replaced by the 3-A which has a number of improvements over its predecessors both physically and electrically.

The greatest difference lies in the use of caesium compound as the photo-active element instead of a preparation of potassium as used in the two earlier cells. The caesium oxide is coated on a half-cylindrical electrode and a small vertical rod forms the positive electrode. The former cells employed as the photo-active element a potassium preparation coated on the inside of the bulb, with a ring-shaped member forming the positive electrode.

To appreciate the nature of the advantage gained by this change, it is necessary to consider the relation that exists between the characteristics of a photoelectric cell and the light used to operate it.

In apparatus for reproduction from sound recorded on film, the most practical type of exciting lamp, or "sound lamp" as it is frequently called, is a metallic filament incandescent lamp. Most of the light produced by sources of this type consists of yellow, red and infra-red radiations, there being comparatively little blue or violet radiation.

The sensitiveness of a photoelectric cell, that is the current it will pass for a given amount of illumination, usually varies with the color of the illumination. In other words, the cell is more sensitive to some parts of the spectrum than others. In the case of the potassium cell, the sensitiveness was greatest for blue and violet radiation. The greater part of the light produced by the exciting lamp was therefore not utilized. The caesium cell, however, is highly sensitive to radiation within the range produced most abundantly by the exciting lamp, namely yellow, red and infra-red.

This results in the 3-A having much greater efficiency than the 1-A or 2-A. This greater efficiency is such that the output averages more than 20 decibels higher. Individual cells, of course, may show a gain less or greater than the average.

A highly important advantage gained from the greater efficiency is the reduction in system noise which accompanies its use. The response from the cell being greater, the amplifiers can be operated with reduced gain, thus reducing the volume of any noise producing element within the system. This makes the new cell an important factor in enabling sound reproducing equipments to do full justice to recordings made by the new noiseless process.

Besides output efficiency, there are other improvements to be found in the new cell, such as its ability to produce a more faithful electrical copy or translation of the sound track; its ability to maintain its electrical and circuit characteristics unchanged and its immunity from rapid deterioration and loss of sensitiveness in storage or use.



Dirigible

Elmer G. Dyer, A. S. C.

Farewell, Depression!

AGFA AnSCO Corporation, formed in 1928 by AnSCO Photo-products, Inc., oldest manufacturer of photographic materials in the United States, is employing twice as many workers today as at the beginning of 1929, according to President Horace W. Davis in his annual report mailed to stockholders last month.

Earnings last year amounted to \$47,380 or almost double the earnings of 1929. This is, of course, a small amount, but it is worthwhile mentioning that during a period of organization and development the corporation has been carrying on its new projects, research work and expansion entirely from its own earnings. Charges against earnings also include considerable amounts set aside for depreciation.

Reserves increased from \$139,858 in 1929 to \$201,254 in 1930 while Capital and Surplus showed a slight increase from \$5,598,162 to \$5,625,080. Current Liabilities decreased from \$843,592 in 1929 to \$464,411 last year and Current Assets from \$4,407,287 to \$4,088,337, thereby increasing the ratio of Current Assets to Current Liabilities from 5 to 1 in 1929 to 9 to 1 in 1930.

"Changes in standards in certain of our products, coupled with conditions generally applying to the past year somewhat retarded the projected normal operations of your company," Mr. Davis said. "It is pleasing to report that production and sales volume have been maintained on a satisfactory basis. The Company's advance during this year has been continuous both in its internal organization and with relation to the trade."

S. M. P. E. Spring Meeting Plans

AS THIS issue of the Cinematographer goes to press only a tentative program for the Spring meeting of the Society of Motion Picture Engineers, to be held in Hollywood, May 25th to 29th, inclusive, is available. It follows:

May 25th—American Legion Auditorium.

9:00 to 10:00 A. M. Convention registration.

Convention called to order at 10:00 A. M.

Opening addresses and response by the President.

Reports of Secretary, Treasurer, Progress Committee, Convention Committee and Papers Program.

12:30 to 2:00 P. M. Luncheon, committee reports and papers program.

8:00 P. M. Get-together gathering of members and guests, with showing of specially selected film program.

May 26th, 9:00 to 10:00 A. M. Registration. 10:00 A. M. Papers program. 12:30 to 1:30 P. M. Luncheon. In the afternoon studio visit, itinerary to be announced later.

Tuesday evening, special papers program, now being planned.

May 27th—American Legion Auditorium—9:00 to 10:00 A. M. Registration. 10:00 A. M. Papers program. 12:30 to 1:30 P. M. Luncheon. Afternoon, visit to Paramount studios. Evening—semi-annual banquet, Roosevelt Hotel, 7:30 P. M.

May 28th—American Legion Auditorium—10:00 A. M. Papers program. 12:30 to 1:30 P. M. Luncheon. Afternoon program of recreation being prepared. The papers committee has a program under consideration for the evening.

May 29th—American Legion Stadium—10:00 A. M. Papers program followed by an open forum and discussion of plans for the Fall meeting.

The Convention Committee is composed of the following: Chairman, W. C. Kunyman, W. C. Hubbard, M. W. Palmer. Papers committee, O. M. Glunt, chairman. The Hollywood local committee is composed of Peter Mole, chairman; D. MacKenzie, C. W. Handley, K. F. Morgan and J. P. O'Donnell. The convention headquarters will be at the Roosevelt Hotel. All technical sessions will be at the American Legion Auditorium.

AUDIO-CAMEX

SOUND-ON-FILM RECORDING SYSTEM



The PRIZE WINNER

Audio-Camex Bullet Type
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Amateur Movie Making

by WILLIAM STULL, A. S. C.

AFTER having been ill for so many months, I find it very hard to adequately express my pleasure at being able once more to resume my activities in this department. Cinematography—amateur and professional—has always given me a vast deal of pleasure, and the opportunities for additional contact with similarly minded souls, and, I hope, for giving them aid in the pursuit of their hobby, has increased that pleasure to a degree that I could scarcely appreciate until my illness suddenly robbed me of it. During my illness, however, it was most gratifying to observe the way in which Hal Hall, in addition to his manifold duties as Editor of this journal, stepped into the breach, and so capably conducted this department in my stead. The kindness of my friends among the A. S. C. and elsewhere, was also most heartwarming, and I wish to take this opportunity to thank them for it, and also to thank my various correspondents for their forbearance with the lack of consideration with which my illness forced me to treat them.

Such an enforced vacation as mine, though less pleasant, is not too different from the annual respite which the winter months often give to amateur photographers, inasmuch as it afforded plenty of time for retrospective consideration of cinematography. And such a temporary cessation of one's active participation in cinematography can frequently serve a very useful purpose. We are all too prone to carry on our hobby with too little study of our past performances—and accordingly with too little attempt to analyze and to correct our mistakes. So if we are to progress—and progress we must—we should now and then take time for careful reflection. There are so many little things which we find, upon such study, that we do wrong in the excitement of making our scenes, which, though they may seem right enough at the moment, will become very inconvenient when our film reaches the cutting room.

Getting the Meaning of Each Scene

For instance, how often do we find that we have grasped merely the externals of a scene, and quite overlooked its real meaning? After all, there is only one reason for photographing anything: **to tell a story**. What that story **is**, is quite another matter: it may be a part of a little drama; it may be a record of some trip or holiday; it may be merely the story of some of Nature's beauties. But the story must be there, or there is no excuse for the scene. Every detail in the making of the scene must be carefully considered so that the whole will combine to tell the scene's story most efficiently, and so that the individual scene will fit in perfectly with each of the other scenes that go to make up the completed picture.

Of course, most amateur cinematographers who have gotten far enough along in their study of their hobby to appreciate the importance of these details have surely progressed far enough to guard against glaring errors in exposure, or such details in direction as allowing exits and entrances to become "crossed;" but there are many smaller details which they will persistently overlook. I think that these are most likely to occur in the simpler scenes which, from their very simplicity, we are all inclined to rush through. For instance, in those scenic films which we all make during our vacation travels, we manage to get along passably enough in the scenes where there are people, for we realize the importance of detail in such scenes; but when it comes to the strictly scenic shots which we shoot separately, to be cut into the more intimate

action of our pictures, we find ourselves far more likely to grow careless. For instance, there is the matter of tonal quality: it is all very well to work for softness or nice color-rendition in these purely scenic shots—but it is something quite different when we find that these individually beautiful scenes must be placed next to wiry-sharp, unfiltered scenes of our action when the film is assembled. There they will stand out like the proverbial sore thumb, so we must remember to either make our action-scenes correspondingly soft, or to make our landscapes sufficiently wiry to match the action.

Then there is the matter of camera-movement. When we are working with actors, it is not so difficult to keep the general movement of the scene (that is, the movement of the action as well as the movement of the camera) flowing in the same direction, for we are consciously thinking of this particular detail. But when we come to making the scenic panoramas, etc., that are to be intercut with the action, we are too likely to concentrate on the individual shot and forget its relation to the rest of the picture. Therefore, it is wise to adopt some general direction for the flow of filmic and physical motion of a picture, and bear that in mind in every scene. Probably the best general direction is from left to right, for it is more positive than the reverse; similarly, if your people are admiring some high objects, like skyscrapers, mountains, or waterfalls, the best direction to follow in both action and vertical panning is from the bottom **up**. In short, always keep your action moving **into** the picture—**toward** the object of interest—not away from it.

Similarly, in such cases, it is well to make sure before starting to shoot, just what is the chief object of interest. I recall one film I have seen which was made in the Yosemite Valley, and in which the cinematographer quite completely overlooked this; he made a number of striking scenes of a beautiful fall in a towering ravine—and quite forgot that the object of paramount interest was the waterfall, and **not** the height of the canyon's rim above the fall. So, in the course of an excellent series of vertical pans of the falls, he persistently continued his pan far above the top of the falls, instead of merely panning upward until he could make an attractive composition of the crest of the falls, holding it for a few moments, and cutting or fading. The result was very irritating, and not entirely remediable by sharp cutting.

Angle-Shots

Another phase that should receive careful consideration is the use of unusual camera-angles. Without doubt, they add greatly to the semblance of originality in a picture; but they must not be allowed to detract from the free and natural progress of the film's story. Their best use is to suddenly accentuate some more or less dramatic action or character. Used wisely for this purpose, they are of very great value; but used for their own sake, in the place of a plain, straightforward shot, which would express the same thought equally well, without breaking up the flow of filmic motion, they can be an equally great hindrance.

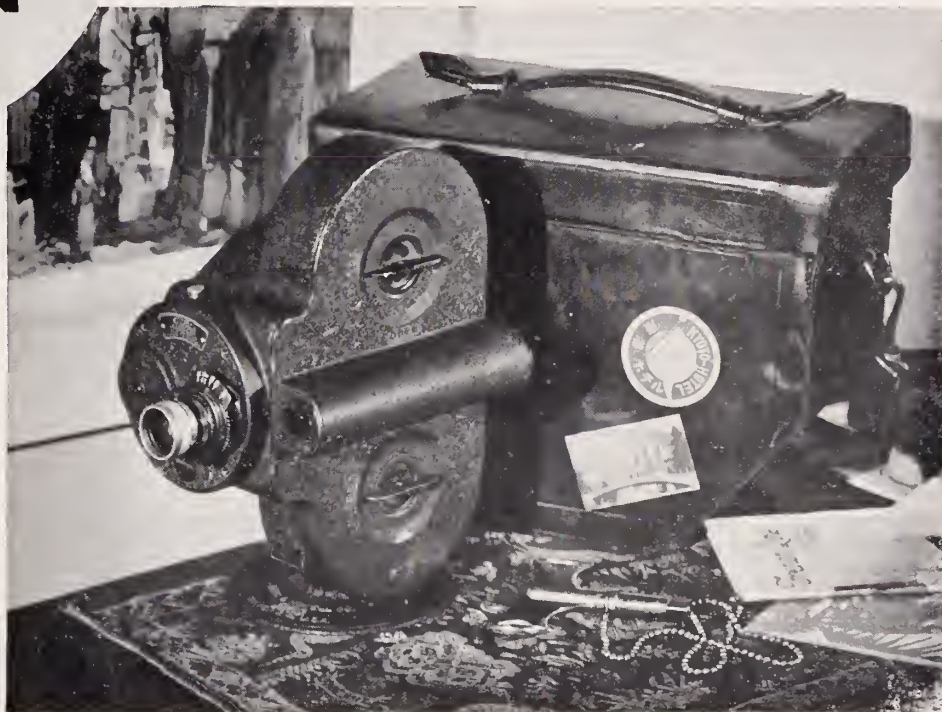
But did you ever try to make one of these shots from an unusually low viewpoint, and still use your tripod? Difficult, isn't it? Well, why not take a leaf from the professional cameraman's book, and use a baby tripod? Of course, there are no regular baby tripods on the market, but if you use one of the several wooden-legged tripods, with a detachable pan-and-

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Upper left, Nuns preparing and decorating a "Reposoire" on the eve of the procession of "Fete Dieu." Upper center, just married and off to the Front in the morning. Upper right, the Executioner's house, Lamballe. Left center, wash day at Lamballe. Right center, Bridge and Cathedral, Lamballe. Lower left, the artist's delight, wooden porch of St. Martin, Lamballe. Lower center, St. Genezio, Saint for children's ills. Lower right, Reredos, St. Martin.

Babbling About Brittany

by LAWRENCE GRANT

This is the second article of an unusually interesting series which Mr. Grant has written for this magazine. The third will appear in the June issue—Editor's Note.

SHOULD you ask a Breton what he is, he will not say with pride, "I am French." No, he will say quite simply: "Breton," then you will say: "Yes, but French?" He will reply: "Breton, yes; French? Perhaps." You will be surprised even today how many of the old people cannot speak French at all. At first I thought they could not understand my French, and who could? But the old ones cannot understand, and do not speak any French at all!! They only speak Breton, which is not at all unlike Erse, the native Irish; in fact being in Brittany is much like being in Ireland. The same facial characteristics, the same picturesqueness, (not quite the same, for never can there be quite the beauty of Cork or Killarney or the poetry of Kildare); the same charm, and again a likeness to Cornish and Welsh; a great similarity to the Welsh language, and why not, are we not all Celts, and proud of it?

(Note: I am a Celt myself.)

So we get right into Brittany at Lamballe, the home of the famous Duchesse de Lamballe, friend and confidante of the unfortunate Marie Antoinette, famous for Pottery, a gorgeous church of Roman, which out of France, we call Norman architecture, and for St. Maclou, a son of Queen Clothilde of these parts.

St. Maclou flourished about the 11th century. It was rather unfortunate because "long-hairs" were just as unpopular then as they are today, and while he and his Royal Mother doted on his long red hair, it was not "being done" by the most robust people, and all the flapper's favorites had to be shaved of head. So the Queen being, after all, just a "Mother" and Maclou being just "Mother's Boy and Joy" had only one thing left to do to protect his hair and him, she made him a monk. And he became very famous as a saintly person, and he could cure almost any disease of the head. In nature's time he died, and they canonized him, as St. Maclou. To be cured you come to his statue in the church, or what the rude revolutionists left of it, for being a royal Saint, they did their best to obliterate him, but, thank goodness, there is still the head left, and you extract a nail from your shoe, and you scratch his nose with it, and ask him to cure you. And he cures you of your headache, but you get a torn thumb dragging out the nail.

At the other end of the town there is one for your child, in St. Martin's church, St. Genefor. He is devoted to children, especially crippled ones. He was a Scotchman, and I never could find out why he came over to poor Brittany, but you bring your child to him and pray and then he is cured and you leave the little one's crutches, or whatever he no longer needs and there is a small box for any offering you care to give, and there is "Merci" already printed thereon to thank you for your gift.

And as I babble about all these things, and these curious Saints, and their powers, please let no one, not even the most ardent Catholic, take offence, I do not mean it so. When you go to Brittany you will understand the remarkable attitude of the Breton of today towards these primitive saints. They are not sure they are really as potent as old stories say, but they do not quite care to let them go, and under the feeling that if they do not do any good they cannot do any harm, they stick to them.

This old church has a lovely wooden porch which has been the delight of architects, it is in good condition, and bears the inscription:

"L'an mil cinq cent dix-neuf
Jean l'aine me fit tout neuf."

which says that John made the porch over "all new" at that time, but it only says "John," who, probably well-known then, is forgotten now.

If you happen to be here at the time of "Fete Dieu" (which is equivalent to our "All Soul's Day" is it not?) you will find everyone very busy preparing for the procession; all along the route there will be side altars set up, some very ornate, some very simple, and at most of these the Priests will halt, say a short service, and then continue round the city. These waits at the "repositoires" as they are called, take time, making the procession a long and tedious affair.

During the revolution there were so many supporters of the Princess de Lamballe and therefore partizans of the detested Royalty and Marie Antoinette in particular in this place that they brought in a special executioner, and as he was a very necessary person, they certainly saw him "well disposed" as Hamlet wanted his actors to be, for they set him up in a most delectable house, still called "The Executioner's House." Uninhabited and falling into ruins when I last saw it, it is full of lovely carved oak, and all could have been bought for a song!

French people are great persons for washing their dirty linen in public, and in all these little provincial places the river is the natural and proper place for this laundry work to be carried out, and very picturesque they manage to make it. Sometimes there may be a solitary laundress outside a cottage back door, or a neat old servant at the back of a larger house, but very frequently there is a public place, constructed conveniently for the purpose, and here, in force, will be the village gossips, soaping and rubbing and paddling and smiting the linen with wooden instruments and scandalling, all making a very pleasant sight and sound, the river running, the smacking of the paddles, the swish of soapy clothes and the pleasant chatter and laughter. The Laundry place at Lamballe is very picturesque, though of course there are many more than this one in the town.

Very rarely does one come on a "snap-shot" which tells a story and is good pictorial construction as well. Even when a Mayor lays a foundation stone, the press generally take a fake photo posed after the event, but coming round a corner one day in 1915 I snapped the group on the other page,

Mother, Son, Bride. Soldier and girl were married that morning, and the next day he was off for the "front."

"C'est la Guerre."

At one of the Benediction services I attended here when the priest held up the monstrance, that is the large gold plated vessel in which he is supposed to put the Wafer, with which he blesses the people, he forgot to put it in, and it was very curious to see his eye peeping through the round hole in the centre of the sort of sun burst halo, where the Host should be.

He was in the most awful state of mind when he discovered what he had done, and could hardly be consoled after the service. You pay spot cash for your seat. A penny (French), the plate going round as for a voluntary contribution. I watched an old woman one night, she, poor soul, had a large coin, but no change so she put the coin in, then took a firm hold of the plate lest it should escape her, and slowly and solemnly counted herself out the correct change.

Nearly all the congregation in these places are peasants, though occasionally the "quality" will also be in the church. In the small villages all are peasants, but in Lamballe I hap-

pened to know, and was entertained by, a very distinguished old English lady, married to a Frenchman, a Madame de Car-gouet, once lady in waiting to Empress Eugenie, and she was re-garded with great awe by the townspeople.

Even the Priests, as in Ireland, very frequently come from the peasant class and though some people quote this against the Church, I do not see much force in the objection. Their religion started with a Peasant, he was followed by Peasants, a recent Pope was a peasant, and as it grew from poor peo-ple to its present high estate, perhaps there is not much wrong with it as long as peasants and the poor hang on to it, and find consolation in it. I suppose it does not require men of genius or people of fashion to have Faith.

I like to look over some of my old hotel bills, (pre-war) and here I find my room was 3 francs, coffee sent up to bedroom, with "crescents" 12 cents (American); lunch with wine, 40 cents; dinner with wine, 50 cents; and I appear to have paid for three days' food and lodging, including wine, about \$5.50 total. I wonder what it would be today?

Things to see: In addition to the things mentioned, as well as driving out to the potteries, at a little place called "La Poterie." Ruins of a castle at Hundaye, about 9 miles away, on the same road as La Poterie, so done same day. Les Ponts-Neufs about 6 miles, at the sea.

Here we are at Lannion, famous for St. Ivy, quite the most popular and powerful Saint in these northern parts, St. Ivy, or Saint Ervoan, of whom the song is written:

"There is not a saint, there is not one,
There is not a Saint, Like our St. Ervoan."

He was a great scholar, an attorney by profession, (imagine an attorney becoming a Saint!) who charged no fees, but took up the cases of the poor against their rich oppressors for nothing, (imagine an attorney doing that! No wonder they made him a Saint) and afterward he became a Bishop. He is usually represented as a student, or as a Bishop, in the myriad statues of him that you will find everywhere hereabouts, on the ground, above the ground, and high up in the air, for they stick him up wherever they can find a corner to put him, even at the corner of the second story of a house in Lannion, as you will see on the other page. It is a lovely old timbered house, but this Saint in all its old bright colors greatly adds to the charm.

But I am going to leave St. Ivy for a moment, who was famous years ago, and ministered to the spirit, and to the financial and property rights of the poor, and deal with a modern celebrity, who ministers to the inner works of man's anatomy.

A man, not a man, an **artist**, M. Jules Prigent, proprietor and chef of the "Hotel au Grand Turc" at this lovely little town. To be the "patron" of the hotel, of any hotel, that is some-thing, because you own it, it is yours, you are someone in the community, you may be the president (or the local French equivalent, if so gay a people can have an equivalent for so serious a group) of the local Chamber of Commerce, or even worse, the song leader of the Rotarians, or you may even become M. le Maire and with the tricolor for a sash, and an old fashioned silk hat, marry the young people, and punish the evil doers in the community. All these things you may do because of your position as the "Patron" of the first local hotel, but if you are also the Chef, if you are also the gas-tronomical marvel that Jules was, and I most sincerely pray still is, if you are such a chef as may, without impudence or braggadocio, claim to walk the same path, the same road as the great, never to be forgotten Savarin, the prince of cooks, then, to be Mayor, to be president of the Lannion Rotary, the Lions, or the Kiwanis, nay, to be President of France, cannot add one cubit to your stature or your fame, for he who can cook, ("cook," the word is too coarse and commonplace for what Jules does to fish and fowl) he who can cook like Jules can have no greater honor than the loving admiration of those

travellers, French, English, American, or any other nationality, who are still old fashioned enough to know the difference be-tween "gigot d'agneau roti, garni" and "roast lamb with trimmings," or who have a palate sufficiently trained, (and still unspoiled) to appreciate the more delicate qualities of "sole a la Colbert" compared with say, "swordfish a la Catalina."

In this country of cooks, Jules, you are a marvel, and I have waited long to pay you this tribute.

And in this little, out of the way place, if you select the Grand Turc, what a reception you will get. You will be shown to your room, you will find it perfect, you may wish a bath, or at least a wash of hands and face, and being fastidious you are travelling with your own soap. Unnecessary here. You will find by the side of your basin, untouched and fragrant, a cake of Roger and Gallet's Violette de Parme, you will find lovely linen towels; probably a bunch of flowers, and you will stroll down to dinner, and for Francs 2.50 (50 cents) you will, or did, get the kind of food indicated. And you will then probably meet your "host" and you will find him the gayest, cleanest person, coming fresh from his kitchen, yet smelling more of Roger and Gallet than of frying and food, a little "poudré," per-haps a little "rougé" and perhaps a little,—well, anyhow I am not going to cavil as to where such a chef and host cares to look for relaxation.

And the funny thing is he thinks he can paint. The place was littered with bad art, and full of good cooking. I can only urge him to stick to the palate instead of the palette.

However, back to St. Ivy, who has a little village named after him and there you will find him ensconced in great power and held in marvelous esteem. There is a pool where he will tell you what will happen to your children should they be ill. He, or his likeness in stone, sticks out from the wall and below is a little pool. Should your child be sick you go to this pool and on its waters, after prayer, **and offering**, you place a pin on the surface. If the pin floats, your baby will recover!!

Now, naturally, you want your baby to recover, and the tendency of a pin is to sink; but, strange as it may sound, "believe it or not" as Ripley says, it is possible to place a pin on still water so gently that it **will** float.

Another method of divining is to float a chemise belonging to the little one on the water, then if that **sinks** she will recover! After all a light little garment spread out has a dis-tinct tendency to **float**, so the little one is in a bad way which-ever method you try.

Of course, the more unpropitious the augury, the more you naturally put in the "tronc" at the side in the little adjacent chapel.

This is one of the districts and towns par excellence for old timbered houses, with lots of inside panelling. For in-stance look at the street illustrated here, and you see some splendid shops all along as far as the picture goes; perfect examples of timbered and carved houses; and the two houses of more pretentious sort standing in another street. Inside, in addition to the panels, you will probably find a mass of old furniture still left, though as the years pass by, tourists are gradually offering prices for all these things that cannot be re-sisted by a more modern generation, and the country side is losing its treasures, and in years to come will also lose the very atmosphere that has drawn the tourists with their money to the land. If they could only look ahead they would **keep their treasures, capitalize them, and never** let them go.

Sabots are passing out, and untidy city made boots are coming in, but only slowly, for sabots are cheap and lasting, also fine for wet and mud.

This father with two sons and two little girls live on the factory, which is the hut, home, store and factory all in one.

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Upper left, St. Ivo, or St. Ervoan, attached to the top story corner of a house in Lannion. Upper right, St. Ivo presides over his fountain. Left center, a typical town house. Middle center, from Lannion churchyard, looking to Brelevenez. Right center, row of shops in Lannion. Lower left, a family of Sabotiers. Lower right, the whole works. Store of lumber at back. Big saw for trimming to size. Son with hatchet shaping. Father finishing with knife. Another son hollowing out interior. They live here, too.

Wide-field Pictures on Narrow Gauge Film

by **FRED SCHMID**

Vice-President C. P. Goerz American Optical Co.

IF WE compare the angle of view embraced by the lens of the usual view Camera with that obtained in motion picture photography we find that the angular field of the motion picture is decidedly narrow.

In a camera for still photography of $3\frac{1}{4} \times 4\frac{1}{4}$ " size the usual focal length of the lens is 5". The angular field on the long side embraces 48° . For 35mm. motion picture film with a picture aperture $\frac{3}{4} \times 1$ " which has about the same proportion as the $3\frac{1}{4} \times 4\frac{1}{4}$ " size plate, a focal length of 2" is the standard. This embraces an angle of only 28° on the long side of the picture.

Now, it is a fact easily checked by visual observation, that most of the outdoor scenes and such events as sports, football, baseball, horse races, etc., which the cinematographer is likely to be called upon to take, have the direction of motion and their principal points of interest mainly in a horizontal direction. The cinematographer will only too often find that he cannot embrace a sufficiently large horizontal field to cover enough of the action which makes the picture worth while taking. He has to resort to panning, an effect often detrimental to an ideal presentation of the picture on the screen.

Furthermore, it will often be desirable to image the principal objects, such as the players in a game, or distant objects as large as possible on the film so as to present them and their actions in detail on the screen. This calls for lenses of still greater focal length than the standard 2" and the angular field of view is further restricted in inverse proportion to the increase in focal length.

The professional cinematographer has been cognizant of this limitation of his camera for a long time but has accepted it as inherent in the making of motion pictures.

With the advent of the "talkies" by the sound-on-film method it became further necessary to cut the already too narrow picture field by fully $\frac{1}{10}$ of its width. The remaining picture became almost square and the unsuitability of such a narrow picture field for a great number of outdoor events was sharply brought to the attention of directors and cameramen, charged with the responsibility of creating motion pictures which would appeal to the artistic sense of their theatre patrons.

The only solution of the problem seemed to be the use of a wider film than the standard 35mm. This made necessary the production of new equipment, not only in cameras and photographic lenses but in new projectors and laboratory machinery for processing this new size of film. The outstanding result is "Grandeur," a picture twice as wide as the standard 35mm. It created considerable interest, its effect was truly marvelous but—it was terribly costly to produce. There followed in the trail of this new development so many difficulties of a technical, optical and especially economic nature that for the present the idea of a general introduction of wide-film motion picture presentation on the professional screen seems to have been laid aside, if not entirely abandoned.

In the field of 16mm. amateur motion pictures the same conditions as to relative proportion and size of the picture prevail. The amateur camera is more or less a smaller edition

of the professional camera, the relation of focal length to picture size is practically the same, the angular field of the screen picture is narrow. A wider field is decidedly desirable. The same objections to the introduction of a wider film than 16mm. hold forth. The many thousands of amateur cameras, now in use, would have to be discarded and the higher cost of the wider film material would be detrimental to a further development in amateur motion picture activities. Fortunately for the amateur motion picture maker, an entirely new solution of the problem of making wide-screen pictures on 16mm. film has been found. This new development lies in the field of optical science and as it is made available for the present for sub-standard cameras only, the amateur cinematographer, for the time being, has an opportunity to "score" over his professional brother in the presentation of wide-screen pictures.

A very interesting and novel auxiliary lens system, based on the computations of Dr. Sidney H. Newcomer, a New York physicist and mathematician, has just been placed on the market by the C. P. Goerz American Optical Company of New York City.

This new lens consists entirely of cylindrical lens elements instead of the spherical lenses of the regular photographic lens. It does not produce an image by itself, but has to be used in conjunction with the regular photographic lenses when taking wide-field pictures. In the same way the same lens must be used in front of the projection lens when projecting these films on the screen.

The function of this new lens system which has been named the "Cine-Panor" is therefore twofold. When used on the camera, it compresses into the narrow film aperture of the 16mm. camera an image which has a 50 percent greater horizontal field than what the photographic lens alone would embrace. This compression takes place in a horizontal direction only, that is, the height of objects remains the same as the photographic lens alone would produce them. The width of objects and with it the extent of the horizontal expanse of the scene appear in the film at only $\frac{2}{3}$ their proper size. If this film were projected in the regular way, the result would be a screen picture of standard size with all horizontal dimensions compressed to $\frac{2}{3}$ their normal width. To bring back the normal proportion of the scene, it is therefore necessary to add to the projection lens the Cine-Panor system by placing it in front of the former. On the screen the proportional size of objects will now be restored, at the same time the picture size will be spread horizontally by 50 percent, giving a picture which is twice as long as it is high, with all objects in effective panoramic perspective. The result is a "Grandeur" effect produced with standard 16mm. equipment and film material. While the Cine-Panor auxiliary system can be applied to photographic lenses of any focal length, some lens mounts possess structural limitations to its application. For instance, the wide-angle lenses of 15 and 20mm. which are now being used with 16mm. cameras, are set too deep in their mounts to allow the correct placement of the Cine-Panor. The same is true in some types of 1" lenses such as the f 1.9 Cine-Kodak lens of 1" focal length. Most of the standard 1" lenses such as are supplied with the Filmo, Victor,



Fig. 1

Fig. 3

Fig. 2

Kinecam, Nizo and other similar types can be converted into panoramic lenses by the addition of the Goerz Cine-Panor.

The horizontal angle embraced by this combination is about 36° , or nearly the same as a 15mm. wide angle lens would take in alone. The advantage of a 1" lens, aided by the Cine-Panor, over the 15mm. lens alone is that, with practically the same extent of field, all objects are almost twice as large as if taken with the 15mm. lens.

The same advantage of wider panoramic field with greater height of the objects is retained with all longer focal length lenses. The field of the 2" lens is increased from 12° to 18° , that of the 3" lens from 8° to 12° and that of the 4" lens from 6° to 9° .

This is a most desirable feature for all long-distance shots and many of the close-ups, where the cinematographer may now select the largest possible focal length to depict his objects within the vertical limits of his picture aperture, at the same time having the assurance of adding 50 percent of action in the horizontal direction to his screen picture.

The fitting of the Cine-Panor to lenses and cameras can be done in various ways. The most desirable method for turret model cameras is to provide a universal bracket holder for the Cine-Panor, attached to the side of the camera. This holder carries at the same time a separate finder assembly, giving the panoramic field for a 1" lens, with demarkation lines for the field of a 2" and 3" lens. Such an attachment does not in any way interfere with the regular use of the camera. Standard size and panoramic pictures may be taken on the same film in any desired sequence. The process of taking panoramic views is in no way different from the usual procedure except that it is recommended to allow for a slightly increased exposure which need not be more than from 10 to 15 percent. This will probably be in most cases within the latitude of the emulsion. The processing of the film, being of standard 16mm. gauge, is done as usual.

In the projection of this type of film it is, of course, necessary to add the Cine-Panor to the projection lens. The same lens which served on the camera is used on the projector. It is merely necessary to fit another bracket holder on the side of the projector and attach thereto the Cine-Panor lens by means of its bayonet lock. This holder has a spring-locked hinge which provides a quick means of swinging the Cine-Panor in front of the projection lens whenever the panoramic sections of the reel are to be shown. A larger screen, twice as long as it is high, will have to be provided however. It is also recommended to have a projection machine with the best possible illumination. If we assume a light source of a given intensity, it must, of course, be expected that the resulting screen illumination will be less if we spread the amount of light over an area which is 50 percent greater than the standard screen size. This is what really takes place when projecting Cine-Panor panoramic pictures. The screen illumination goes down about one-third. It is therefore an advantage if the projector has means of stepping up the intensity of the light source in case the density of the film positive should make it

desirable to increase the illumination when panoramic pictures are being shown.

While a real appreciation of this novel presentation of panoramic pictures can only be had by viewing the wide screen picture, the illustrations accompanying this article will help the reader to a clearer understanding of the working of this new lens. Fig. 1 represents a normal view as taken with the 16mm. camera. Fig. 2 shows how a wider horizontal view is compressed into the normal aperture proportion. A comparison with fig. 1 will show that the height of objects is the same, while their width is compressed to two-thirds. Fig. 3 illustrates the screen picture with all proportions correctly restored as in fig. 1, but with an increase of 50 percent in the horizontal field.

This same principle of producing wide-field screen pictures with standard 35mm. cameras and projectors can be adopted for the professional screen as well by making the auxiliary lens system of suitable size. That it hasn't been done is most likely due to the uncertainty in the minds of motion picture producers whether, under present economic conditions in the motion picture industry, the time is opportune for introducing this new feature.

It may, however, well be possible that results being obtained in the 16mm. field with this new auxiliary lens system will act as an incentive to producers in the professional field to take it up. It would be proof that a reciprocal interest in each other's achievements between the professional and amateur motion picture producer will be fruitful to both and work for an advancement of their art.

Filmo Topics

BELL & HOWELL'S interesting monthly magazine, *Filmo Topics*, contains much of value to the amateur in the May issue. This magazine may be secured free by writing Bell & Howell at 1801 Larchmont Ave., Chicago, Ill. The contents for May follow:

TAKING KODACOLOR MOVIES.

TRY IT, ANYWAY—A plea for the discarding of cinematographic mental hazards, with evidence of the results to be obtained by so doing.

THE AMATEUR EMULATES THE PRO—A discussion of the uses of the new B & H Focusing Alignment Gauge.

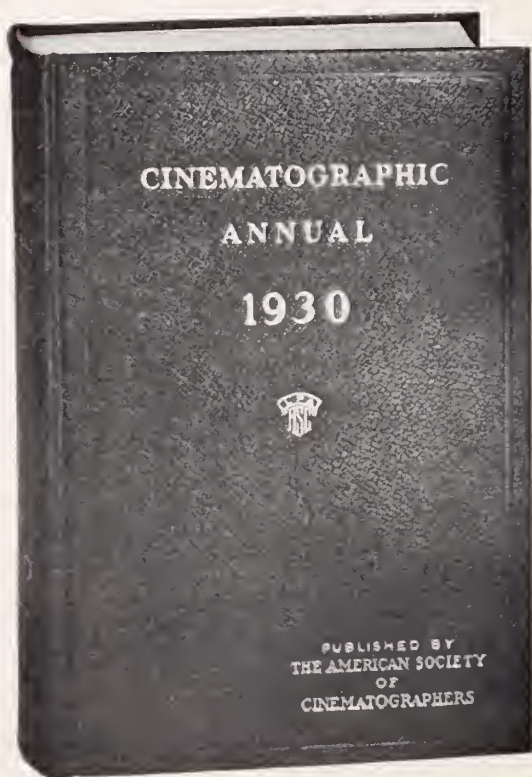
FILMING AS YOU FLY—Some notes on the correct technique in taking movies from the air.

FILMO NEWS PICTORIAL.

TITLING YOUR FILMS—No. 8. More ideas on title making from *Filmo* owners.

THE FILMO PROJECTOR "POWER PLANT"—Explaining what makes the wheels go 'round.

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Making the Amateur Movie

A British Amateur Gives Some Good Tips

by J. P. LAWRIE

IT ISN'T long after the possession of a home movie camera that the enthusiastic owner turns his mind to shots other than those of Alice running down (or up) the garden, and young Bill playing on the sands at Brighton! These, and kindred subjects have already cost a small fortune, and Oh, the distressing sameness of these films!

A feature film is obviously the next step and, whilst joining an amateur club for this purpose is undoubtedly the best thing for anyone to do, it is a regrettable fact that the great majority do not. Perhaps this is just as well—imagine a successful club of say 100 members, everyone determined to be the camera man! for of course, the camera owner, if he is a true enthusiast, will be camera man or nothing!

Well then, let us leave the club members alone and presume that they worry along without trouble. The non-member, deprived of the facilities for meeting others of his kind, promptly ropes in all his friends of both sexes, and in a wave of intense excitement a story is fixed, the players cast and shooting ultimately commences.

The result is that before the film is half taken, most of the band are half hearted, and by the time the thing is finished, quite half of the group will have drifted away.

This is caused by the extraordinary fact that over half the number originally recruited have nothing to do! It is not within the province of this article to detail just how the film should be taken or produced—that is the task of the directing men, etc. The trouble is that when all such jobs as actors, director, camera man, continuity, etc., are fixed, there inevitably remains a residue of very keen, but rather disappointed workers with no job save that of hangers on. The flagging and failing interest of this section will undoubtedly affect the others, and may spoil things quite a lot.

It is possible to give everyone a job of some sort that will make them feel that they are really taking part in the production, and will keep their energy and interest going the whole time. A few such posts are enumerated below:

1. Appoint some one to keep an eye on the exact position of props, etc., and keep a note of the actors' clothing.
2. Musical Director, either pianist or gramophile. Let him browse over and study the story for his setting, and why not let him try his stuff out during rehearsal?
3. A Liaison Officer. Select the most tactful of the party to interview folk to get permission for exterior shots.
4. Appoint a Film Editor and
5. a film Titler. (These two can work together.)
6. Art Director. This is most important, even if only for title backgrounds.
7. Appoint a Boundary man to see that other people and players not on the set keep off it. And during outdoor shots, keeps an eye on the background, giving a warning when stray cars and folk appear on the scene.

One could keep on indefinitely with such a list and, although many of these jobs may not at first glance seem strictly essential to the success of your film, it will be found that the distribution of such tasks, whilst being really useful in that, as the filming proceeds, so do such necessities as editing, titling and musical setting, thus speeding up the whole production but the interest of everyone concerned is maintained right up to the end.

A final point, much celluloid will flow through the camera ere the film is finished, and a fair percentage of this will go into the waste film box. Is it not worth while to give everyone a brief mention in the preliminary titles? It only takes a few feet of film, and is exceedingly gratifying to the more humble workers in the cause—try it!

Babbling Through Brittany

(Continued from Page 34)

First the huge pieces of wood, (I think elm); these they tackle with the very big saw, then they begin with a huge and very sharp knife to carve out the figure of the sabot. The Father does this and the knife is fastened to the block at the extremity so that tremendous leverage can be obtained, and he can cut off chunks, or the thinnest of shaving, so expert is he. Then when the form is there, the boy takes it over. He puts it in a vise, and with hand gouges and augers he carves out the inside. Now when you buy a pair they will cost you, or did then, about 50 cents!! And no salesman can tell you: "They will be easier in a day or so, Madam, when you have walked in them a little," because these **will not** stretch. They will be the same today and forever. But then suppose you go to buy a pair, and nature has cursed you with some abnormality of foot, well you point out this promontory to the boy, and there and then he will hollow out a little sort of cave to fit that projection neatly, and you will be better off than with leather, because doing this does not change the contour of the outside of the shoe. How many a dainty new shoe in a shoe shop becomes a thing of horror when after a day or so some person's ill-used, ill-shaped foot has "worked into it."

The pin and shirt putting in St. Ivy's pool, is like workmen in a certain factory town in England, the day following the Easter holiday of two days, (Sunday and Monday). On Tuesday they all gather outside the factory at the correct time to start work, but then they pass through a ceremony called "throwing the brick." Someone says: "Let's toss up whether we go back today, or take another day holiday." So a man tosses up a brick, they having decided that if, when tossed, the **brick stays up in the air** they will resume work.

This is what is called "safe and sane," but they all await the decision breathlessly in case the brick should by a miracle stay up, and work become a possibility.

Latest Television Test

TELEVISION on a two-foot square screen, with close-ups almost as clear as motion picture scenes, was demonstrated in Chicago recently by Ulysses A. Sanabria, youthful inventor. Black and white pictures of near-by persons were reproduced across a room. Harold Hayes, Federal radio supervisor, described the images as the best he had seen in three years of watching television development.



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attention

The pictorial section of the next volume of the Cinematographic Annual is being compiled. Anyone wishing to contribute prints for this section may send them in now for consideration.

Amateur Club for Hollywood

A LONG felt need of the Los Angeles and Hollywood district bids fair to be filled by the Amateur Cinema Association of Hollywood, which is now being organized in the film capital. This new club is starting under the brightest of auspices, and is affiliated with the Amateur Cinema League. Its purposes, to quote from the by-laws which are now being drafted, are: "the furtherance of our combined interest in and study of the motion picture as a medium of art, education, and entertainment; to encourage experimentation and the study of the art of cinematography; to produce amateur films for exhibition; to propagate a film spirit in favour of a higher standard of theme and artistic depiction."

The following officers have been elected for the current year: President: Mr. H. Wellesley Devereux; Secretary: Miss Edna Helmerich; Treasurer Mr. W. J. Lander.

Two additional officers have yet to be elected after the adoption of the by-laws. These five in all will compose the Board of Directors, in whom the government of the Association and the management of its affairs will be vested. The handling of the various branches of the Association's activities (such as Scenario writing, costume and set design, casting, location and property management, photography, etc.) will be relegated to various temporary or permanent sub-committees to be appointed by the Board of Directors and approved by the members. Pending the election of the remaining two directors, the work of the President, Secretary, and Treasurer in forming the Association and other initial plans is being supplemented by a temporary Formation Committee.

Though the Association is as yet only in the nucleus stage, it is receiving enthusiastic support from some thirty members, while new members are constantly enrolling. Stories written by several of the members are being considered as material for the Club's first production, and work on the continuity and actual production are soon to follow. Screen tests for casting are already under way.

The Association holds regular meetings each Tuesday night at the Hollywood Studio Club, when matters of business and production are discussed and arranged, lectures are given by various authorities on different branches of motion picture arts, and films—produced by the members, or borrowed from the Amateur Cinema League's library—are shown. Among the recent speakers and visitors at the Association's meetings have been Joseph A. DuBray, A. S. C., Director of Technical Service for the Bell & Howell Company, and William Stull, A. S. C., of the American Cinematographer.

"The Association extends a cordial welcome to all individuals interested in any phase of amateur cinema production," states the President, Mr. Devereux. "Furthermore, we feel unusually fortunate in that, being located as we are in the heart of the professional film world, many of our members have had experience in different phases of professional production work in the studios. This should be of the greatest benefit to other members of the organization who are bona fide amateurs, and serve as well to give our productions a more finished quality than is generally found in the initial efforts of an amateur group."

New Q. R. S.-De Vry Distributor

THE Q. R. S.-De Vry Corporation has appointed as exclusive Western distributor—Phil Lasher Ltd.—with offices at 300 7th Street, San Francisco, Calif. The new company will take charge May 1st and will specialize in motion picture equipment and photographic supplies, dealing in both 16mm. and 35mm. silent and sound with a special department on visual education.

Phil Meisenzahl who has represented the parent Q. R. S. Co. for the past twelve years, will join the Phil Lasher company May 1st. Mr. Meisenzahl will have charge of the southern district while Mr. Lasher will remain in the North.

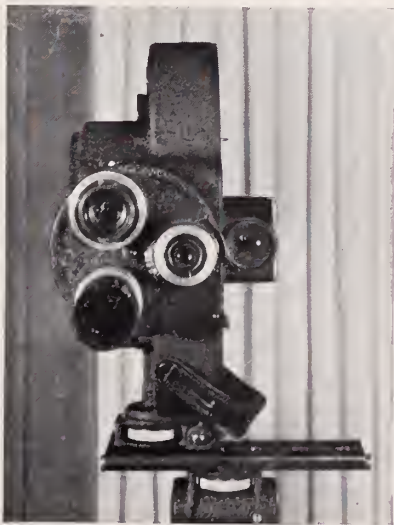
Focusing Alignment Gauge for Filmo



New focusing alignment gauge in use

ADVANCED amateur cinematographers and scientific research workers, including surgeons and doctors, who require precision results in their close-up motion picture work, will be particularly interested in the Focusing Alignment Gauge, just announced by Bell & Howell as an accessory for any Filmo 70 or 70-DA camera, especially for the latter. Every Filmo owner interested in title making will welcome the added possibilities for obtaining professional results which are provided by the new unit, which is an adaptation of a similar Bell & Howell device used with the professional cameras and is only six inches long by three wide.

On the Filmo 70-DA, with which the new accessory will be found most useful, the spyglass viewfinder is set to one side of the photographic aperture. While the finder has been placed as close as possible to the aperture, still there is enough offset to hinder accurate framing in extremely critical close-up work. On the other side of the 70-DA turret head is a critical focuser which permits of hypercritical focusing on an area in the exact center of the total picture area. The focusing position is necessarily even farther removed from the lens photographing position than is the viewfinder.



Showing camera in position for exact alignment with viewfinder

The focusing Alignment Gauge takes care of the offset in each instance. It attaches to a standard thread small camera tripod by means of the regular screw. The Filmo 70-DA

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camera then attaches to the gauge's sliding block by a thumb screw. The block on which the camera is mounted slides on a precisely machined tool steel track resembling a lathe bed. Three accurately placed holes in the bed cause automatic locking in view finding, focusing, and photographing positions. Thus the viewfinder, and later the critical focuser, may be centered and used exactly where the lens will be when the picture is taken. One can therefore readily imagine the boon this will be to the title maker and to the man who does much close-up work.

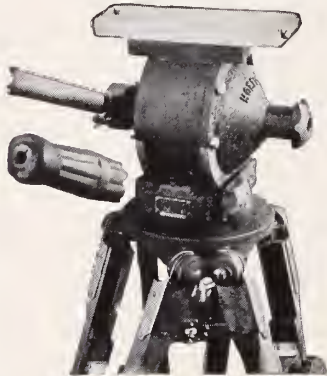
For trick title work involving double exposures the new accessory will be found particularly useful, due to its ability to line up different shots so that they will center perfectly and be focused accurately. As everyone will readily admit, nothing is more objectionable in this type of work than to have one of the exposures fuzzy and the other sharp or to have one of them a bit off register.

For surgical and medical photography, for industrial photography particularly of small objects, in fact for all work where accuracy of alignment and focusing is desired on close subjects, this new device should be valuable.

New Levee Contract

M. C. LEVEE has been presented by B. P. Schulberg with a new contract as executive manager of the Paramount studios.

New TRUEBALL TRIPOD HEADS

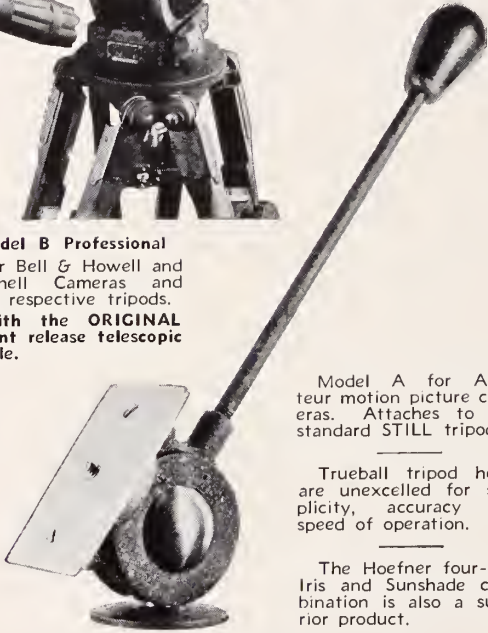


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Of Interest to DeVry Owners

THE FOLLOWING notification from the Q. R. S.-DeVry Corporation should prove of interest to all owners of their equipment. The notice follows:

We are very pleased to advise that through our engineering resources and the ability to manufacture Portable Projectors, we are now entering the market with a Sound-on-Film Talking Motion Picture Projector and, in the course of manufacturing this new unit, we have provided features which will enable our engineering department to convert your present DeVry Silent Portable Projector into a Sound-on-Film.

No doubt you are finding an urgent need for a sound-on-film portable projector with the same degree of portability, which will show both silent and sound pictures. We know you are interested and would be very pleased to give you full details on how your present silent portable projector can be converted if you will kindly return the enclosed business reply card with your name and address, giving details as to the model and number of the projector you are now using.

We also wish to advise that our Portable Sound-on-Film is manufactured completely in our factory, each and every part being under the supervision of very capable engineers and it is not an assembled job. When we convert your present silent portable type into a sound-on-film you can be assured that each and every part going into this equipment will be supervised and manufactured in our plant. The highest degree of workmanship and best of material available are incorporated into our new sound-on-film unit.

Portable Sound Equipment

(Continued from Page 21)

The bullet type microphone furnished with this outfit is two stage microphone and uses condenser transmitter. It is built with a swivel head which can be pointed in any direction and is made of the very best materials obtainable. It has a Cannon connector and the covering can be removed in a few seconds by loosening three screws and is very easily accessible to change the tubes. The microphone stand is collapsible and of sturdy construction as the microphone is the heart of the unit and the stand must be sturdy enough to protect this delicate instrument.



Art Reeves

The camera motor hangs under the tripod and drives the camera with a flexible shaft. It is quickly attached and the camera can be operated by hand or by motor.

With this double system one is sure of always getting good sound track and it will more than pay itself, and be more practical for carrying the extra weight of a recorder and the recorder motor battery to be sure and have results, for after all it is the result that counts.

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Form World Wide Theatre Equipment Corporation

THE ANNOUNCEMENT of the forming of the World Wide Theatre Equipment Corporation should be of unusual interest to all theatre owners. The following facts are included in the announcement:

No. 1. A Corporation comprising a nucleus of 15 or more manufacturers of theatre equipment, all of whom are to be manufacturers of non-competitive lines.

No. 2. The Corporation offices to be established in a principal city of the United States.

No. 3. The Corporation officers will consist of President, Vice-President, Secretary and Treasurer and a Board of Directors consisting of one representative from each manufacturing organization admitted to membership, in addition to the active officers above mentioned.

No. 4. The Corporation will conduct its business, correspondence, literature in the form of catalogues, loose leaf trade and price lists, promotion work pertaining thereto, in the language of the country with which it does business.

No. 5. The Corporation will cause to be printed on all its stationery and literature, with the exception of envelopes, the name of each associate manufacturer.

No. 6. The Corporation will undertake four campaigns—(a) Direct to the theatre campaign, (b) Dealers educational campaign, (c) Newspaper and magazine advertising, (d) A campaign through the U. S. Department of Commerce and its foreign field offices.

No. 7. The Corporation will establish a bureau of information. This bureau to work in cooperation with the U. S. Department of Commerce in so far as is practical and possible. Its purpose will be to act as a medium between this organization, the U. S. Department of Commerce and any and all commercial organizations now in existence, or hereafter to be formed, relating to our particular lines of endeavor, thereby bringing all members of our Corporation into closer contact with the dealers and the purchasers.

No. 8. The Corporation will maintain a showroom, displaying a full line of samples which are to be supplied by the manufacturer.

No. 9. The Corporation will, as soon as possible and practical, place before 40,000 foreign theatres the knowledge, use and advantages of the manufacturers product.

No. 10. Each manufacturer will become a part of this Corporation in the form of stock holdings, said stock will be the VOTING STOCK.

No. 11. Each manufacturer will have a voice in the management of the Corporation through its representative on the Board of Directors, in addition to participating in the profits of the Corporation.

No. 12. Each manufacturer will give the Corporation the exclusive rights of distribution and sale of his non-competitive products for the entire world with the exception of the United States.

No. 13. Each manufacturer will deliver to the Corporation all inquiries from prospective purchasers or otherwise, as and when received from foreign countries or from foreign representatives located in the United States.

No. 14. Each manufacturer will have, through this Corporation, a wider introduction and distribution for his products through the world than is now at his command at a cost much less than it takes to introduce his product in one specific country.

No. 15. Each manufacturer's prospective customer for his product will know that they are dealing with a reliable organization made up of dependable manufacturers of the highest standing and not "BOOTLEGGERS."

No. 16. The efforts and full cooperation of all manufacturers in the Corporation will be co-ordinated into one unit thereby producing far greater benefits than through individual effort.

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Ground Noise Reduction

(Continued from Page 13)

UX-250 tubes in parallel, fed by a 180-volt storage battery. A small meter control box containing two 0-to-500 milliammeters is used with a switch for breaking plate current and aiding battery current to the voice coils.

Each voice coil has connected in series with it a milliammeter indicating the variations of current in each circuit. A variable resistance is also used in series with the battery to adjust its value so as to make the voice coils balance electrically, that is to say, when one is at maximum current, the other is at zero, and vice-versa. These meters, therefore, represent the movement of the shutter.

Work on the system described was first started in November, 1929. Practical results were obtained in February, 1930, and the device put into production on Radio Pictures, "Dixiana," in March, 1930. "Dixiana" was released in August, 1930. After further development, the system was again used on Radio Pictures' production "Half Shot at Sunrise," released in September, 1930. Since this time, development has continued with the aim of simplifying and reducing the amount of apparatus necessary and to procure simpler adjustments in operation. The device will continue in use on forthcoming R-K-O productions.

Amateur Movie Making

(Continued from Page 30)

tilt head (such as the Thalhammer, for instance), it is easy enough to get an exact set of legs, cut them off to the proper length—a foot or perhaps 18 inches—and then shift your complete tilt-head onto the baby whenever you need it. Try it!

The Latest A. C. L. Bulletin

One of the most interesting little booklets which has come my way for some time is "Exposure in Essence," by Russell C. Holslag, the Technical Consultant of the Amateur Cinema League. Officially this monograph is Bulletin No. 4 of the League's Technical Service for its members, and it is, despite its brevity, one of the most complete reviews of the exposure problem yet printed. Volumes could be written upon this important subject, and Mr. Holslag is to be congratulated upon the excellent way he has condensed the vital facts of exposure into this neat, 32-page booklet. Beside treating both the theory of exposure, and the principles of the more common types of exposure-meters, the author gives considerable attention to practical examples of exposure. Furthermore, he emphasizes a fact which is all too seldom stressed: that the proper exposure for any given scene is not necessarily that which would be technically correct for the scene as a whole, but that which is best for the object of chief interest in that scene. If any criticism were to be made of the book, it would be that too little attention was apparently paid to securing illustrations which would give visual demonstration of this, and similar points, and thereby increase the effectiveness of the excellent text.

Talking Movies Aid Sales

GEORGE W. STOUT, Advertising Manager of the Perfect Circle Company, makers of piston rings, declares that talking motion pictures have proven one of the greatest sales promotional efforts ever made by his organization. He predicts that such pictures will become one of the major selling forces within the next two years.

Mr. Stout's organization uses the Bell & Howell Filmophone, and says that in January of this year their pictures were shown to 11,549 people; February to 10,269. He declares that they can put over things more forcefully with the pictures than in any other way.

FOREIGN NOTES

First India Sound Studio Opened by Madan Company

THE first studio in India for the production of sound pictures has been opened at Tollygunge, suburb of this city, by Madan Theatres, leading circuit operators. The new studio is built on a site comprising seven acres of land and the building itself is 100 feet long and 30 feet wide. Recording equipment used is RCA Photophone, mounted on two five-ton trucks, one of which carries the power unit and the other the actual apparatus. It was decided to make the equipment portable in order that it might also be used for newsreel work.

European Sound Picture Theatres Show Striking Gain

THAT EUROPE has gone "talkie" in no uncertain manner is evidenced by the striking increase in the number of theatres wired for sound reproduction during the past few months, according to advices received in the Commerce Department Motion Picture Division from Trade Commissioner George R. Canty at Paris.

According to the report the number of sound theatres in Europe increased from 5,400 on October 1, 1930, to 7,720 on January 1, 1931, a gain of 1,320 within three months.

New Diet Film

AN INTERESTING and instructive film, "Food Makes a Difference," has been made by the Motion Picture Department of the U. S. Department of Agriculture, sponsored by the Bureau of Home Economics. The film is in two reels and shows the defects resulting from poor feeding, and also shows very well how these defects may be overcome by proper food. It is a picture that is of vital interest to all parents. It may be secured for showing by Parents Associations, womens' clubs, etc., free, by writing the Department of Agriculture at Washington, D. C.

French Firm to Market New Wide Screen Device

PARIS—A new company, the French Societe Technique d'Optique et de Photographie, has been formed to market the Hypergonar, a device invented by Professor Henri Chretien, which is claimed to make possible the projection from ordinary film to wide screen without revamping of apparatus. The Hypergonar is described as an optical system, which is placed in front of the camera when scenes are shot, and compresses the images optically.

Sydney Device Company Chartered

SYDNEY—Sound Re-Productions, Ltd., a new equipment company, has been chartered here with a capital of \$30,000, to take over an improved apparatus for reproducing sound from sound recorded films and all improvements in such apparatus. Incorporators are L. Rowson, H. G. Guinness and G. Crick.

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Government Sound Pictures

PRODUCTION of sound pictures has been initiated by the U. S. Department of Agriculture in its own studio in Washington. A complete sound-on-film recording system has been installed by the department's Office of Motion Pictures and the work of scoring lecture pictures is going forward.

The recorder has been installed to run synchronously with projectors equipped for the projection of sound-on-film, so that it can be utilized for scoring existing silent pictures with sound effects or lectures, as well as for recording speech in synchrony with cinematography made by a camera interlocked with the recorder. The old projection room of the Office of Motion Pictures has been converted into a sound studio for scoring.

One of the films scheduled for conversion into "talkies" is, "Forests or Wasteland?"—a Forest film completed last fall as a silent film. Another is the Indian Sign Language film that the Office of Motion Pictures is making for the Department of the Interior, under a special appropriation. Maj. Gen. Hugh L. Scott, retired, will deliver the lecture that is to accompany this film, which is designed to constitute a permanent record of the Indian sign language.

The Department of Agriculture now has in circulation more than 200 of the nearly 400 films made since its motion picture work was inaugurated, about 20 years ago, but it is likely that relatively few of these will be made over as "talkies." Department officials say that the rapidity with which production of new talking pictures develops will depend largely on the demand from the extension field, and that there is reason to believe that this demand will be greatly stimulated in the near future by the appearance on the market of cheaper and more portable sound-on-film equipment than has been available to field workers.

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A NEW portable projector, known as the Jones Ace and designed especially for use in sales instruction, sales promotion, and for use in institutions, theatres, auditoriums or homes where the projection of a bright, clear, steady picture is desired up to 15 feet in size over a distance of from 10 to 120 feet, has been developed and is being marketed by the Earle W. Jones Research Laboratories of New York.

Equipped with a sound head, which the company claims from an engineering standpoint is absolutely foolproof, the Jones Ace, while sturdy in construction and designed to stand the strain of heavy duty work, is light in weight. Castings are of the highest grade aluminum and the total weight of the projector is only about 35 pounds, the company states.

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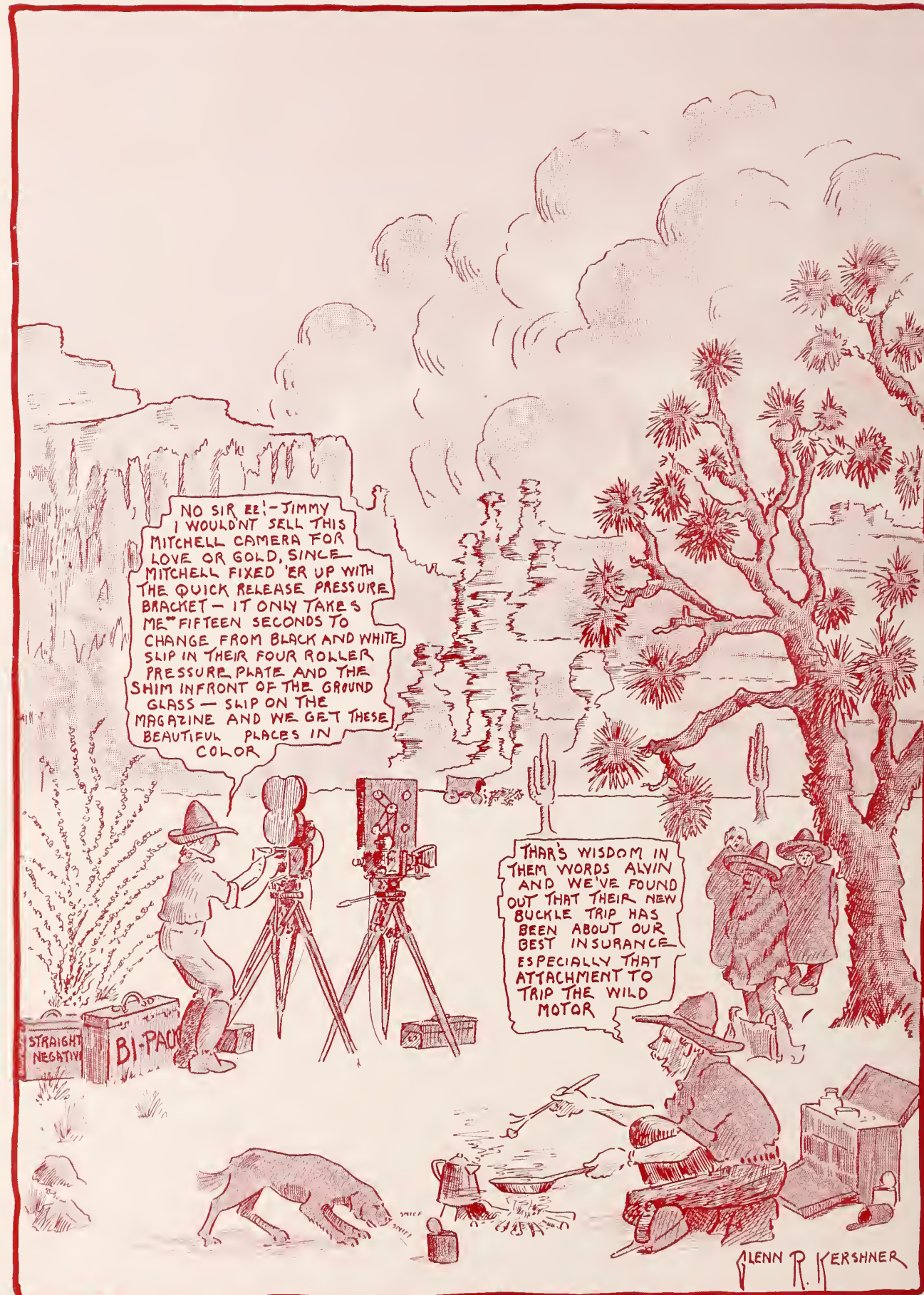
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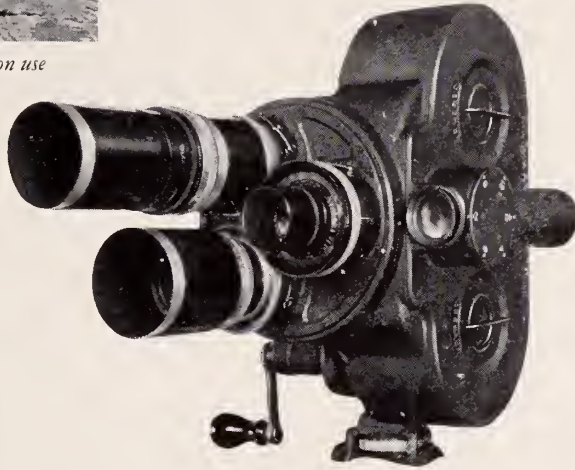
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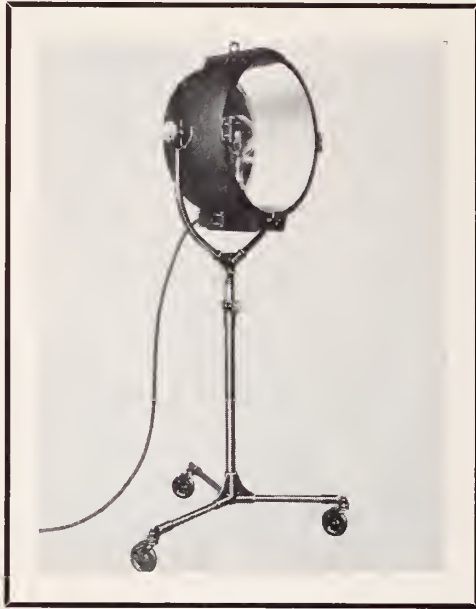
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JUNE, 1931

Number 2

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Q. Dear, Dear Doctor:

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J. (Pansy) Pett,
Crushed Narcissus Film Laboratory.

Ans. The Doctor is forwarding his opinion under separate cover by express.



Q. Dear Doc:

I am 23 years old and 5 feet 4 inches tall and weigh 120 lbs. in my overcoat. I bought a sound outfit which consists of about 12 cases and weighs less than 1000 lbs. I don't mind packing the stuff around. The only trouble is that by the time I get the stuff on the job and everything unpacked and set up to work it is either night time or the story is over. What do you suggest.

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I. M. Lowe

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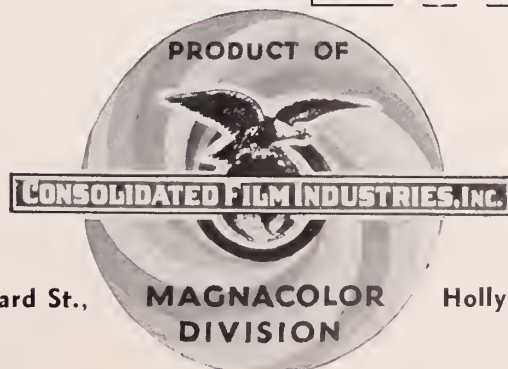
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Lower left, Fig. 1, made on old-type stock. Exposure 1 second at F:8. Lower right, Fig. 2, same lighting, super sensitive stock. Exposure 1/5 second at F:8. Upper right, Fig. 3, old-type film. Two 1000-watt flood lights with two silks on each, and one 400-watt back light, with one oiled frost. Exposure, 2 seconds at F:8. Upper left, Fig. 4, same lighting, but super sensitive film. Exposure 1/5 second at F:8.

Super-Sensitive Film and the Still Man

by EMMETT SCHOENBAUM

THE STILL cameraman's job has never been a bed of roses, but since the introduction of super-sensitive motion picture film it has become considerably less so, for when you are using a still film which is something like sixty per cent slower than the motion picture film for which the set is lighted, you begin to encounter many new troubles in addition to all the old ones to which you've become more or less accustomed. In the first place, since your film is so vastly less sensitive than that which the cinematographers are using, and for which the set is lighted, you find yourself compelled to double or treble your normal exposure—which, heaven knows, is already quite long enough to give you trouble with movement by nervous stars, or when you are working with a large company. But then, even with this increased exposure, the difference in the sensitivity characteristics of the two emulsions is such that you will not get the same lighting effects and contrasts that the cinematographer does in his picture. Obviously, you can't relight the set just for a still!

Then, too, there is the equally important matter of color rendition. If a set is designed for the new super-sensitive motion picture film, you cannot get the same color values in your stills with the old type of still film, even though you use filters which, while improving your picture, will also force you to increase your already over-long exposure by some four or five times. And, with such glaring differences in color-rendition, your stills are almost valueless as reference materials for the art, costume, and makeup experts, or for the players, themselves.

Another thing which the still man has to bear in mind in his work is that the majority of it, in addition to being of high photographic and artistic quality strictly as photographs and records, must be made for reproduction in all the countless newspapers and magazines which the Publicity Department supplies with material. This means (except in the case of a few of the very best magazines) that the still will suffer greatly in reproduction. It is somewhat as if the cinematographer had to shoot his picture with the consciousness that all but two or three of his release-prints were to be "dupes," and ranging in quality from merely poor ones to extremely bad ones. Therefore the still man has to see that his pictures are not only of the same tonal gradation and quality as is the film, but that they maintain a certain boldness of outline (for the newspapers and poorer magazines) without loss of the detail gradations and quality which the better magazines and studio use demand.

This was a considerable problem before, when the still and the motion picture could be shot on emulsions

of practically identical characteristics, but now that the Super-sensitive motion picture film has come into use, it is even more difficult.

But the introduction of Super-sensitive still film has not only eliminated these new difficulties, but actually reduced some of the old ones. Now you can shoot your stills, not on a film which is **approximately** like the one the cinematographer has in his camera, but on one which is **identically** the same as his film. You can use his fast film lightings unchanged, and match his effects to a hair. You can shoot reference stills of sets, costumes, and makeups which will perfectly match the color rendition and tonal gradations of his moving picture. And you can make your stills with the requisite boldness for reproduction work, and at the same time get such fine detail contrasts, and luminous shadows as never before.

I have just finished shooting the stills for Pathe's production of "The Common Law," starring Constance Bennett, directed by Paul L. Stein, and photographed by Hal Mohr, A. S. C. Mr. Mohr used super-sensitive film for this production, while I started it with ordinary Panchromatic cut film. But I soon enough found that the only way to match Mr. Mohr's cinematographic results with my stills was to change over to Super Sensitive still film! During the first three days of the production, the tremendous differences between the fast film which Mr. Mohr was using and the slow film that I was using gave me an endless amount of trouble—and the fourth morning found me with Super Sensitive cut film in my plateholders. From then on, I was not only able to hold up my end of things properly, but to produce stills of a better quality than anything I had ever done on the older stocks. And the immensely shortened exposures, and equally improved quality were quite as welcome to both director and star as they were to Mr. Mohr and myself.

Perhaps the most significant quality which I found in the new film—aside from its speed—was the improvement in color rendition. It reproduces colors in almost the exact scale of relative brilliancy with which they appear to the eye. This has a really startling effect upon the perspective; it gives a far greater illusion of depth and roundness. This is highly important in still work, for a still, probably because of its lack of motion, almost invariably seems flatter than its corresponding motion picture. Thus, working with the new film in both the motion picture and still cameras, we can be sure of making full use of all the visual aids to securing proper depth and perspective which the set-designers have given us, by means of the coloring of the sets and backings.

(Continued on page 29)



Hal Mohr and Mr. Schoenbaum comparing old and new film results. This picture was made with one 1000-watt light. Lens stopped to F:16, exposure 1/5 second.

Society of Motion Picture Engineers

Spring Convention One of Most Interesting in History of E

by HA

AFTER listening to the reading of sixty-eight papers prepared by some of the most outstanding minds of the technical field of motion pictures, this writer hesitates to even attempt to report the Spring Meeting of the Society of Motion Picture Engineers, held in Hollywood the last week of May—May 25th to 29th, inclusive, to be exact.

It is too much to expect one small mind to grasp so much technical data and digest it well enough to more than touch upon what took place. At the outset, we do wish to say that a meeting such as this gives us the reason why America leads in the motion picture production of the entire world. These men live and breathe the problems of the technical side of the industry and most of them are devoting their lives to the advancement of the science of picture making along lines which seldom come to the attention of the millions of theatre patrons who rarely, if ever, give a thought to the mechanical wonders that make pictures possible.

But, to get back to the meeting. It was held in the beautiful building of the Hollywood Legion; very adequate quarters for the purpose. Buron Fitts, District Attorney of Los Angeles County; Clinton Wunder, Executive Manager of the Academy of Motion Picture Arts and Sciences; and Commander Stephen Hall of the Hollywood Post 43, American Legion, gave addresses of welcome to which President J. I. Crabtree responded. Following the usual organization details, the meeting swung into the business of the presentation of the papers. The first was a paper on "Detail in Television" by D. K. Gannett of the American Telephone and Telegraph Company. This was followed by the showing of the famous "Baron Shiba Films." These films created much interest. They were made in Japan at very high speed, and were projected so as to show in slow motion certain very high speed phenomena. One of the most interesting features of the meeting.

Frank P. Brackett, Director of Brackett Observatory, Pomona College, then presented a paper on "Sound Pictures in the Solution of Eclipse Problems," which was of unusual interest. This was followed by a paper on "Reversing the Form and Inclination of the Motion Picture Theatre Floor for Improvement in Vision," by Ben Schlanger of New York. Mr. Schlanger advocated that theatres be constructed so that the back of the theatre floor would be lower than the front. He declared that more ease of vision could be secured if we look up at the screen instead of down as the present design of the theatres forces us to do. C. J. North and N. D. Colden of the Motion Picture Division, Bureau of Commerce, Washington, D. C., then gave a paper on "The Latin-American Audience Viewpoint to American Films," which brought out the fact that these countries want our box office personalities, even though they may be speaking English—providing titles in Spanish make the action clear. It was pointed out that Spanish versions with unknown players are not so popular.

In the afternoon of the first day Dr. C. E. K. Mees, Director of the Research Laboratory of the Eastman Kodak Company, presided at a symposium on Color Photography. At this symposium J. A. Ball gave a paper on "Technicolor"; R. M. Otis read one on "Multicolor Process"; Bruce Burns presented another on the Multicolor Laboratory; W. V. D. Kelley talked for fifteen minutes on the "Hanschiel Color Process"; and

Custav Brock presented a paper on "Hand Coloring of Motion Picture Film" in which he dealt with the advantages of selective hand coloring, and gave a description of the equipment used.

Following the color discussion, G. S. Mitchell gave a paper on "Making Motion Pictures in Asiatic Jungles," which was of unusual merit and interest. H. E. Edgerton of the Massachusetts Institute of Technology read a paper on "The Mercury Arc as a Source of Intermittent Light." Mr. Edgerton pointed out the possibility of the use of intense intermittent light for moving pictures and special photography and reviewed the limitations of sources of intermittent light. He showed that the characteristics of mercury-arc thyratron that are advantageous for flashing intermittent light are namely: 1, The light is photographically actinic. 2, The duration of a light flash can be made less than ten microseconds. 3, The light intensity is high. 4, The frequency of flash is easily and accurately controlled by means of a grid.

On Tuesday, May 26, the morning session was devoted to a symposium on Sound Recording, presided over by Colonel Nugent Slaughter, Chief Engineer of Warner Brothers Studios. E. W. Kellogg and C. N. Batsel of R-C-A Victor Company, gave a paper on "A Shutter for Ground Noise Reduction." This was followed by a paper by Barton Kreuzer of R-C-A Photophone on "Noise Reduction with Variable Area Recording," which dealt with the methods of accomplishing noise reduction, together with the factors influencing equipment design. An analysis of circuit operation was also provided. "Time Constants" of the apparatus were covered and a complete description given.

J. J. Kuhn next followed with a paper on "A Sound Recording Machine" described as a machine suitable for studios using either variable area or variable density methods of recording. It employs a novel type of film aperture and a new method of focusing the sound lamp. Carl Dreher, always interesting, read a paper next on "Recording, Re-recording and Editing Sound Film." Mr. Dreher is chief of sound at the R-K-O studios, Hollywood. Next came a paper on "Recording Sound for Split Mat Photography," by L. E. Clark of the Pathe Studios. He dealt with the problems which arose at one studio as a result of the use of double exposure photography, and the methods, more practical than scientific, which were developed to meet the needs.

L. D. Grignon of the Paramount Studios, then read a paper on "Operating Problems of Recording Equipment," in which he treated briefly the organization of a sound department, and followed with much information gained from experience relative to the maintenance of the studio sound equipment. It was highly enlightening. "Recording on Sound Stages with Portable Units," by Charles Felstead, of Universal, was the next paper. Merritt Crawford closed the morning session with a paper on "Pioneer Experiments of Eugene Lauste in Recording Sound," which was one of the most interesting papers of the morning.

Dr. L. A. Jones of the Eastman Kodak Company, opened the afternoon session with Part 1 of a three-part paper on "Sensitometry," which was one of the most exhaustive and ambitious papers presented at the meeting, and which was handled as only Dr. Jones can do it. D. R. White of the

Engineers Hollywood Meeting

Engineering Organization. Sixty-Eight Technical Papers Presented.

HALL

DuPont-Pathe Film Manufacturing Company, next presented a paper on "Characteristics of DuPont Panchromatic Negative Film" which was of general interest and ably handled. Emery Huse of the Hollywood Laboratory of the Eastman Kodak Company, then read a paper on "Characteristics of the New Eastman Negative Film." Mr. Huse's paper was followed by Fred Westerberg, A. S. C., of Hollywood, who presented a paper on "Standardization of the Picture Aperture and the Camera Motor—a Needed Development." A very comprehensive paper from a practical cameraman. Friend Baker, of Hollywood, then read a paper on "A New Auxiliary Finder." This was followed by a paper from Ira Hoke, another Hollywood Cinematographer, on "The Camera of Tomorrow." L. W. Physioc, also a Hollywood Cinematographer, then presented a paper on "Problems of the Cameraman," which was of much interest.

Wednesday morning was devoted to a symposium on Studio Practises. Hans Drier of Paramount gave a paper on "Miniature Models of Sets" which was both instructive and interesting and well prepared. "Use of Dialogue in Sound," by Colonel Joy of the Producers Association, was next. This was followed by an extremely interesting and somewhat technical paper on "The Depth of Field of Camera Lenses," by A. C. Hardy of the Massachusetts Institute of Technology. "Making a Motion Picture," by W. C. Harcus of Paramount, followed. This, together with informal discussions comprised the activities of the day.

In the evening, the semi-annual banquet was held at the Hotel Roosevelt, with one of the biggest gatherings in years on hand, including many of the outstanding players and directors and executives of the picture world.

Thursday morning session was devoted to a symposium on Laboratory Practises, presided over by Dr. V. B. Sease, Director of the Redpath Laboratory, DuPont-Pathe Film Manufacturing Company. Dr. Jones read the final part of his paper on "Sensitometry." This was followed by a paper on "The Effect of Exposure and Development on the Quality of Variable Area Photographic Sound Recording," by Donald Foster of the Bell Telephone Laboratories; a paper of extreme merit and highly technical. This was followed by a paper from G. L. Dimmick of R-C-A Victor Company, on "The Study of Exposure and Film Processing for Variable Area Recording."

W. P. Bielick of R-K-O Studios, then read a paper on "The Processing of Variable Area Sound Records in the Film Laboratory." This paper discussed from a practical standpoint the commercial methods of developing and printing variable area sound film. An effective method of processing sound film must produce the optimum values that have been determined in theory, according to the paper, the problem being to obtain these values in commercial laboratory practise where larger quantities of film are processed.

Roy Hunter of Universal then presented a paper on "Universal Developing Machines," describing them and their work in detail. The next paper was by J. I. Crabtree and L. E. Muehler of the Eastman Kodak Company. It was on "Reducing and Intensifying Solutions for Motion Picture Film." The authors pointed out that it is possible to correct for errors of exposure and development with incorrectly processed images on motion picture negative and positive film by either adding

an opaque substance to the image which is known as "intensification," or by removing silver therefrom which is known as "reduction," or by a combination of the two processes.

The properties of a large number of known intensifying and reducing solutions have been studied in detail to determine formulas suitable for use with motion picture film.

For intensification, the chromium, Monckhoven (mercury), and silver intensifiers were the most satisfactory. The Monckhoven intensifier is useful for extreme intensification where permanence is not essential and the chromium intensifier is suitable for negatives where a medium increase in contrast is desirable. The degree of intensification may be controlled within limits by a variation of the time of redevelopment. For



Pres. J. I. Crabtree

negatives and projection prints, intensification with silver has been found to give strictly neutral images and the process permits of easy control of the degree of intensification. So far as is known both the chromium and the silver intensified images are stable.

For subtractive reduction such as in the case of over-exposures or fogged images, the use of either (1) a two-bath formula comprising separate solutions of potassium ferricyanide and sodium thiosulfate, or (2) a modification of the Belitzski reducer is suitable. Where proportional reduction is required, a solution containing ferric ammonium sulfate with sulfuric acid is recommended.

It has been found that the above methods of intensification and reduction are applicable to sound film with the possible exception of subtractive reduction which, by virtue of the lowering of resolving power, causes a loss of high frequencies.

A paper on "Improvements in Motion Picture Laboratory Apparatus," by C. E. Ives, A. J. Miller and J. I. Crabtree of the Eastman Kodak Company, was next presented. This paper pointed out that the increased entertainment value of the modern motion picture is due in a considerable degree to the elimination of spots, scratches, and unevenness in the film. This achievement is a result of continuous effort on the part of the laboratories to improve their methods and equipment. One problem which the laboratory supervisor has always to face is that of securing a definite degree of development and a uniform exposure control in printing.

(Continued on page 26)

A Non-Intermittent Camera

by WILLIAM STULL, A. S. C.

IT IS no longer safe for anyone who would be considered an expert on motion picture technology to brand anything as "utterly impossible," for if he does he is very likely to wake up one morning and find that some enterprising engineer has made his impossibility an accomplished fact. Color, sound, silent camera-movements, machine development, and may other equally difficult engineering accomplishments have so recently blossomed into fact as to convince one that the life of a cinema engineer must be dedicated to the assault of the highly improbable. But one last fortress has remained to the skeptic: the non-intermittent camera. That, at least, was and would always remain an impossibility! From the very inception of the cinematograph, the intermittent movement of the film past the aperture has been held to be one of the basic principles of the moving picture. It was, in fact, one of the cornerstones of the power of the once mighty "Film Trust"—the great Motion Picture Patents Company; and, although necessity is reputedly the mother of invention, neither this necessity nor the efforts of scores of earnest workers brought forth a practical, non-intermittent camera. Therefore, said the wise ones, such a camera is an absolute impossibility!

Of course, it must be admitted, more than a few physicists have evolved means of making cinematographic records of ultra-high-frequency electrical discharges, using the discharge for both subject, illuminant, and shutter, but none of these were more than laboratory experiments, and totally incapable of photographing normal action on a set. Therefore, in truth, the non-intermittent camera must be an impossibility!

But is it?

At a recent meeting of the American Society of Cinematographers, very conclusive evidence to the contrary—in the form of a practical, non-intermittent camera, and successful films made therewith—was presented.

And another theory was exploded!

The inventor of this new camera is Senor Gabriel Garcia Moreno, lately a successful banker of Mexico City, Mexico, but for the past two years a member of Hollywood's cine-technical colony. Although Senor Moreno's vocation was banking, his lifelong avocation has been the design and construction of optical and cinematographic machinery, and when once he had, in his Mexican laboratory, evolved the principles upon which his new camera is constructed, he came to Hollywood to perfect and manufacture the camera itself. With him in his firm he has had the good fortune to associate Mr. Silas E. Snyder, long and favorably known to cinematographers as the Editor first of *The American Cinematographer*, and, more recently, of the *International Photographer*, and Mr. William G. Fairbank, a capitalist and organizer of great ability. And under the combined efforts of these three, the new Moreno-Snyder Continuous Camera has become a fact.

It is vastly surprising that so considerable a degree of success as has been theirs has come in so short a time, for, beyond the single, basic fact that the camera makes a motion picture upon conventional film by means of a conventional lens, everything about the camera is new, not only in design, but in principle. There have been, and still are, difficulties encountered in minor details, but the demonstration given the A. S. C. was sufficient to prove that, whatever minor defects may exist (and, incidentally, many of these have since been overcome), the principle is correct, and non-intermittent cinematography is within the range of commercial probability. That, as Mr. Coolidge is wont to remark, is progress!

Surprisingly enough, the camera is not, externally, greatly unlike the conventional studio apparatus. The same general layout of essential units is noticeable. But within, the camera is unlike any piece of cinemachinery extant. Perhaps the first point that is noticed is that the film apparently travels **backwards**. It passes from the righthand, or rear magazine, through an astonishing series of loops in the camera-mechanism, and feeds into the left-hand, or front magazine, where it is spooled with the emulsion side turned **in**, quite reversing normal practice.

But a second glance reveals a surprising simplicity in the film-motivating apparatus: there are but four moving parts! The film passes over a conventional master-sprocket, past a small, continuously-revolving feed-sprocket, **upwards** through a roller-tensioned aperture-plate (which is so proportioned that black-and-white, bi-pack or even tri-pack color-processes may be used interchangeably), over another small, continuously-revolving take-up sprocket, and into the magazine. These three sprockets and an ingenious, revolving lens-wheel, which rotates about them, and is on the same shaft as the master-sprocket, are the sole moving parts of the camera. This lens-wheel, or optical shutter, is the heart of the camera. It consists of an octagonal, steel plate rigidly affixed upon the main-shaft of the camera, and bearing on its outer edge—and at right angles thereto—eight rectangular, plano-concave lenses, which supplement the regular lens of the camera, and, moving with the film, rectify the continuous movement thereof, and effect a steady, motionless image upon each frame. These lenses, or prisms, are specially ground to Senor Moreno's formula, are perfectly matched, and are immoveably set in their places by both mechanical clamps and cement. It is possible to break one of these prism-units, but not to get it out of alignment. And in case of breakage, the damaged unit can be removed from the wheel, and replaced, with perfect assurance that the accuracy of the camera will be unaffected, as the lens-wheels are assembled upon a single optical machine of Senor Moreno's design, which, it is stated, sets these lenses in place with an accuracy of less than .00001".

However, since this camera has no true shutter, the cinematographer may well begin to ask, about this time, how is the exposure to be controlled? There are times when one can neither reduce the lens-stop nor use neutral-density filters: how, in such cases can you then reduce your exposure, with no shutter to manipulate? Senor Moreno's answer has been by fitting his aperture with a variable slit, not unlike those used on certain continuous printers, and which is controlled from without. The dial upon which the controller for this slit operates is graduated to read in equivalent shutter-openings, from 360° to 0°; therefore this device need cause the user no concern. Furthermore, it is geared so that it may be used to produce camera dissolves, quite as conveniently and effectively as the familiar dissolving shutter of a conventional camera. From the unusually large extreme aperture indicated —360°—it may be imagined that a tremendous range of exposure is possible, but this only tells half the story, for the continuous movement of the film and the absence of any shutter increase this amazingly. At the standard recording-speed of 90 feet per minute, and a shutter-aperture of 170°, the conventional camera gives an equivalent exposure of 1/48 second; while, at the same film-speed, but with its maximum "shutter-opening," this camera gives an exposure of 1/24 second.

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New Angles on Fast Film

by **CLYDE DE VINNA, A. S. C.**

THERE was a time, not so long ago, when a cinematographer felt himself bound to look askance at new technical developments in his craft for fear that they might in some way lead to expensive photographic failures and the dreaded retakes. Fortunately, that day is past; the progressive cinematographer of today has confidence both in the research laboratories of the manufacturers from whence come these innovations, and in his own ability to successfully adapt his technique to the requirements of any improved process or equipment which may come his way.

So it is, then, that instead of being beset by fears and doubts of the newly introduced Super Sensitive Films, most cinematographers thought only of finding out just how and where their work and methods of work could be bettered by the use of the new products. This is quite as it should be, for unless a cinematographer has this confidence in a product, he should not use it; and unless he has the same complete confidence in his own ability, he should never undertake the photographic direction of a picture.

Therefore, the question in our minds today is not "Will fast film hurt our work?" but, "Where will the use of fast film help our work?"

From my own experience with this new film, both in exhaustive tests of every type, and in actual production, it seems to me that it is almost impossible to say just where the new film will **not** be beneficial, for its possibilities seem all but unlimited. I believe that, in one way or another, everyone in the company from the Supervisor down, is benefited by its use. This is no idle statement, for during the production of my present picture, "Politics," I have asked the opinions of many representative members of the troupe, and all are agreed that the new film does, in many ways, directly benefit them.

The first person to whom I addressed my query was the Supervisor, Paul Bern. He replied very positively that it was a great help to him. "It is not so much," he said, "the monetary saving resulting from the lower electrical consumption on the set which interests me. That is important enough, of course, but no producer will quibble over a few hundred, or even a few thousand amperes more or less if he knows that the artistry of his cinematographer is going to suffer because of it. But, as I have watched the 'rushes' of this picture I have constantly noted the new artistic opportunities that the new film has given you, Clyde, in your photography. The picture is a comedy-drama, and as such it presents an entirely different artistic problem from such of your recent films as 'White Shadows' and 'Trader Horn'; but I have noticed—and marvelled at—the way this new film has enabled you to use dramatic lighting-effects without sacrificing the perfect overall definition that a comedy requires. I don't believe that the old film could have done it, for the older film, a picture was photographically, either a drama or a comedy; but you and the new film have combined to make this film a real comedy-drama—a comedy with dramatic cinematography—and the first of its kind. And to my mind, this artistic achievement is far more important than the saving in lighting which the cost sheets tell me you've also made."

The next persons to whom I addressed this inquiry were the two stars of the piece, Marie Dressler and Polly Moran. They, too, were equally enthusiastic. Miss Dressler's verdict was characteristically positive: "Of course, I'm not a photog-

rapher, Clyde, so I can't judge the photography as you would, though I've noticed that the photography you've gotten with this new film is much clearer than ever before, and at the same time softer and more natural. But what has impressed me most is a detail that you people who work on the other side of the cameras never think about: that it is tremendously more comfortable to act for this new film than it was for the old. You people across the camera-lines never have to go through the discomfort we actors do, in rehearsing, rehearsing, and again rehearsing under those hot lights, and then of making take after take of each scene, still broiling away under your big lights. But now that you've started using this new film, you don't have to use nearly so many lights. I notice, and, since the few you do use are much smaller, it makes a tremendous difference in our comfort. And since we actors are more comfortable on the set now, we can give our best thought and energy to our work, rather than to the problem of trying to keep half-way comfortable under those darned lights. That way, we can do more work with less fatigue; perhaps the best way I can demonstrate that is through my own experience. You know that under the big lights we had to use for the old film, I tired very easily, in spite of all that every member of the troupe did to make things easy for me—and by the middle of the afternoon I was always fagged out, and had to quit and go home to rest. But, with the fewer, smaller lights you use for this new film, there's nothing except the actual work itself (which I like!), to tire me. I don't mind rehearsing under the lights, and I'm good for as long a day's work as any of the rest of you."

Miss Moran was equally enthusiastic. "You know more about the photography of it than I do, Clyde," she said, "but Marie and I know more about the comfort of working with this new film than any cameraman ever could! Working under those hot lights, we had a thousand unpleasant thing always distracting our minds from what we were doing—wondering what the heat would do to our makeup, if it would make it run, if the perspiration would show through, and a lot of other things all centering around the big question of 'when will that darned cameraman let us out of this oven for a breath of air?' But now it's different: we can feel like human beings no matter how long you and the director keep us under the lights. We're cool and comfortable, and don't have to worry about anything except what we're doing with our parts. Believe me, if anyone is looking for a real, old fashioned fight, just let him try and switch back to the old film for my next picture!"

Soon after that, I asked the director, "Chuck" Reisner, what he thought of the new film. He, too, liked it, but for still another reason. "I'm not afraid that you'll fall down on photography, Clyde," he told me, "no matter what sort of film you use. Photography is your business, just as direction is mine—and neither of us would be here if he didn't know how to deliver the goods. But, after all, we're here simply to make it possible for the actors to tell their story to the audiences. In the final analysis, that's why everyone on the lot, from Mr. Mayer down to the gateman, is here. So it's up to us to make it possible for our players to do their work, to tell their story, just as easily and perfectly as possible. That's what I'm aiming for in my direction, and what you're aiming for in your photography. And everything that will help us to do this is just so much to the good. This new

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Screen Definition

by **DR. L. M. DIETERICH**

Consulting Engineer

Part VII.

IN THE issue of September 1930 of the "International Photographer" the author analyzed in Part II of the article "Screen Characteristics and Natural Vision" screen-depth effects from the scientific-artistic and psychological points of view relating especially to mono-lens and bi-lens photographic results and to monocular and binocular vision as well as their correlated screen effect possibilities.

It is the object of this article to analyze the optical possibilities in lens design to more closely approach with standard lens performance the effects of nature upon the human optical organs.

The author desires to emphasize again that the term "stereoscopic", especially as far as motion pictures are concerned, is in this industry almost universally misunderstood, not only as far as describing an optical problem of practical possibilities, but also as a problem which it would be desirable to solve.

It must be fundamentally understood that there is an elementary difference between the perceptible record or visual impression upon the retina of the human eye and the actinic record upon a light sensitive, usually plano-surface.

In both monocular and binocular vision and photographic records produced by stationary single or multiple lenses only such objects coincide or register a single picture which are of a given distance from both human or artificial optical systems.

This distance, usually called the plane of sharpness, is actually a spherical surface, the center of which is the optical center of either eye or lens and the radius of which corresponds to the momentary focal value of either of them.

Any objects lying closer or farther away produce in both cases double images.

This can be easily demonstrated for the human optical system by holding for example two pencils, say 6" and 12" away from the eyes, parallel and upright. Looking at the nearer one sharply, the farther one will clearly show double and vice versa.

Taking any photographic lens on the other hand and covering same with the exception of two horizontally and diametrically opposed circular holes (double aperture), objects "in focus" will appear as well defined "single" picture records whereas all objects nearer or farther away will appear double.

In natural vision the focus of the eye, however, changes continually as we scan the field before us and by the effects of persistence of vision, the sharp single picture impressions predominate, whereas the fleeting, unsharp, blurred double images are psychologically suppressed with the result of a mental perception of all objects in view in even, though not needlesharp, but soft definition.

In lens records produced with a double aperture lens, however, only object points "in focus" appear as a sharp and single record, whereas all other object points produce double indelible records, the duplex effect increasing with the distance of these points from the so-called plane of sharpness.

These demonstrative proofs have only been related to horizontal separation of images, as the human eye ranges predominantly horizontally and as the double aperture has been considered in horizontal direction only. As we, however,

progress in this analysis we find that the single human eye as well as the uncovered single photographic lens have these image separation or double image effects not only in a horizontal but also in a vertical or any angular direction. For human vision this can be proved by tilting the two pencils from vertical to horizontal or intermediate position and for a photographic lens by rotating the two aperture mats before the lens into any angular position before taking a record.

If we now take a photograph with an uncovered lens the result is similar to that by taking a photograph with a mat with a diagonal slit and rotating such mat for 180° during one exposure. A picture is produced with objects "in focus" sharp and with each object point "out of focus" composed of double images in all directions, thereby forming for each such point a circle, commonly called a circle of confusion, which increases with the distance of such point from the "plane of sharpness" and with an increasing unsharpness thereby producing the well known out of focus effect.

The same result impresses itself in natural vision momentarily upon the retina of the eye, but as above explained, the momentary out of focus effects are during the continuous and instantaneous changes of focus suppressed and replaced by the sharp single impressions of all the points in the field. By the action of the persistence of vision, however, the sharp and unsharp impressions result in the "soft" picture we see and which cameramen continually try to approach by use of filters, diffusion discs, gauzes, special light control, etc.

In binocular vision a circle of confusion is produced by each eye and blended by the human optical system into an approximately elliptical image with the long axis in line with the parallax of the human eyes, usually in a horizontal direction. The nerve reaction produces a final perception of the object as if perceived from the two foci of this ellipse blended together into "one" soft image.

By using a double lens camera with a horizontal lens separation, the indelible circles of confusion enlarge and separate in a horizontal direction, the doubling or blurring effect increases and is not suppressed by any "in focus" images.

An increasing lack of registration results and if such an image is looked upon, the human optical system cannot correct this duplication by change of focus and correlated suppression, because the distorted picture lies in one plane (the surface of the photograph).

This distinctly double impression of the same object point on one surface can only be blended into one nerve picture by additional optical means so as to prevent the left lens picture to be seen by the right eye and vice versa.

By taking a separate photograph with each lens as a basis, a number of methods or means have been developed for the above purpose.

All of these so-called stereoscopic photographs, when viewed through and by specific optical means produce an approach to natural vision but only for a specific predetermined focal distance and of a so far visually and practically unsatisfactory degree of satisfaction as far as motion pictures are concerned.

In the next installment some of these endeavors shall be explained and analyzed.

The New Eastman Sensitometer

by **EMERY HUSE, A. S. C.**

West Coast Division Motion Picture Film Department, Eastman Kodak Company

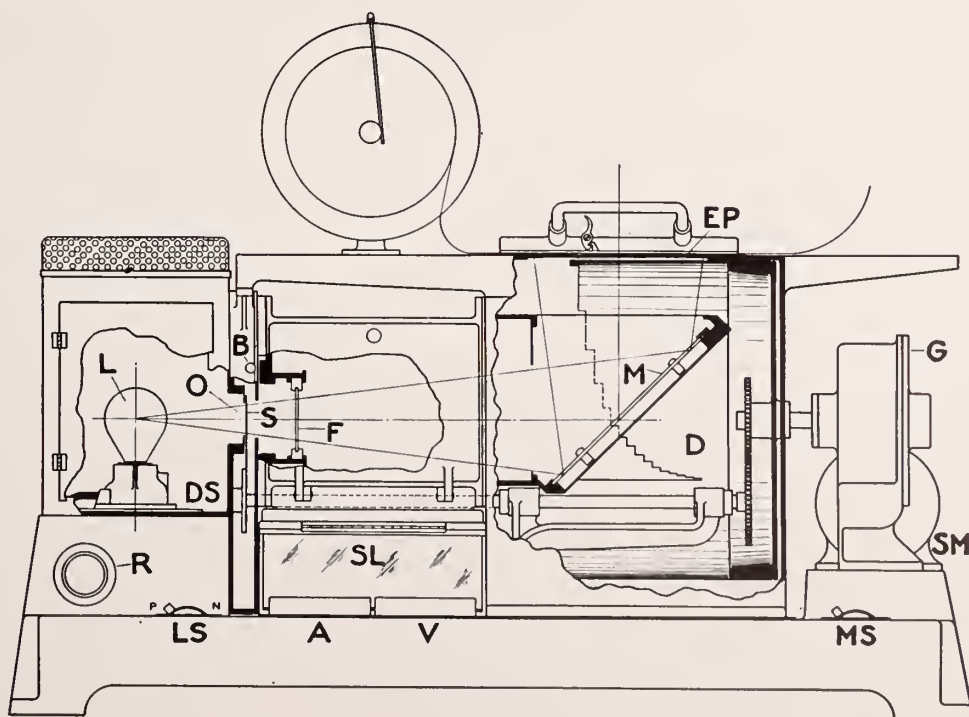
THE TECHNICAL branch of the motion picture industry has needed, particularly since the inception of sound photography, a standardized method of sensitometry. That phase of sensitometry which needs the most attention from the standpoint of standardization, is the instrument on which the initial exposures are made, namely, the sensitometer itself. Up to the present time there has been no instrument available on the open market which could by any means be considered a standard. The Eastman Kodak Company has in its various branches sensitometers which to them are standards and whose operation and setup is based on technical facts. Recently the Kodak Company has completed an instrument designed particularly for motion picture control work and it is this instrument which will be described in this article.

The new Eastman Sensitometer is designed especially to meet the needs of the modern motion picture film laboratory and sound department. It provides a precise and rapid means of making routine sensitometric tests for the control of development processes and for other purposes bearing on the production of picture and sound prints of the highest quality.

The particular advantage of the instrument, aside from its operating simplicity and ruggedness of construction, lies in its precision. It impresses on the film under test an accurately predetermined scale of exposures which may be maintained constant from test to test over long periods of time. This exposure scale consists of twenty-one steps produced by exposures equal in illumination and ranging from 1 to 1024 in relative times, each exposure being 1.414 (square root of 2) times as long as the next shorter. This constant factorial difference between steps permits the density readings to be spaced at equal intervals along the log E axis, in constructing a density-log exposure curve.

The instrument is shown in detail in the accompanying figure. This shows a partial vertical section through the optical axis of the instrument. "L" represents the standard lamp which is the source of illumination. A selectively absorbing filter, F, is placed in the path of the light coming from the lamp, L, in order to modify its spectral composition to the desired quality. A plane mirror, M, reflects the light at right angles thus illuminating the exposure plane, EP, in which the photographic material is placed during exposure. The rotating cylindrical shutter or drum, D, having 21 exposure slots increasing in length by logarithmic steps from the shortest to the longest, controls the time factor of the exposure incident upon the adjacent steps of the exposure scale. The exposure plane is equipped with suitable guides so that two strips of 35 mm. motion picture film may be placed in position and exposed simultaneously. The platen, PL, when pulled down, serves to hold these strips accurately in the exposure plane during exposure. The drum, D, is driven at a constant angular velocity by a synchronous motor, SM. This motor runs at 1800 rpm when operated on a 60 cycle alternating current supply line and at 1500 rpm if operated on a 59 cycle alternating current supply line. The drum is connected to the synchronous motor through the reduction gear, G, consisting of a worm and worm wheel having 150 teeth, thus driving the drum at 12 rpm when operating on a 60 cycle line and at 10 rpm on a 50 cycle line. When the machine is started by throwing the master switch, MS, the motor drives the drum continuously at a very uniform angular velocity, the desired exposure being made by the operating of the selector shutter, S, which opens while the photographic material is protected from the exposing radiation by the opaque portion of the drum, D, and closes immediately after the series of

(Continued on page 21)



The Sensitometer

Television in Color from Motion Picture Film

by **HERBERT E. IVES**

Bell Telephone Laboratories, New York.

IN SPECULATIONS on the possible uses for television, one project which receives considerable attention, partly because of its relative ease of accomplishment, is the transmission of images from motion picture film. It is true that the practical simultaneity of event and viewing, which is the unique offering of television, is lost when the time necessary for photographic development of the film intervenes. Nevertheless it is conceivable that if this delay is small, television from film may still possess such an advantage over the material transportation of film as to give it a real field. A further possibility, more remote, but within the range of legitimate speculation, is that television apparatus may sometime be used to receive, in the home, motion pictures of the sort now offered in the theatres or in home projection outfits. However distant these mergings of the two arts may be, the technical problems presented are pretty clearly defined, and offer interesting features for study.

Among these problems is the transmission of images in color from colored motion picture film. This paper describes a method of accomplishing this, using the receiving apparatus for television in color recently described, and special sending apparatus which utilizes the latest form of colored moving pictures—the ridged film now marketed under the name of Kodacolor.

As an introduction to the method of telecinematography in color using ridged film, it is profitable to outline how the problem could be solved with film in which the colors are incorporated by dyes (e. g., Technicolor), and the three-color transmitting and receiving system recently developed in the Bell Laboratories.¹ This may be done most easily by considering Fig. 1, where the three-color transmitting apparatus is shown in section, with the addition of film handling means. The

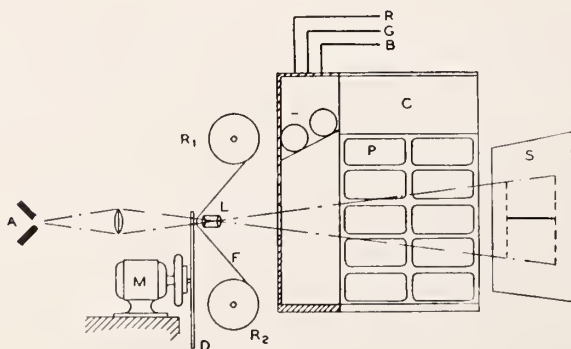


Fig. 1

photoelectric cell cabinet, containing three sets of color-sensitive cells with appropriate filters, is indicated at C, from which three communication channels, R, G, and B, carry the red, green, and blue signals to the receiving end. At A is the arc lamp, whose light is condensed upon the perforated disk D, which is driven by the synchronous motor M. The lens L projects an image of the disk upon the matte white screen S, from which light is reflected back into the photoelectric cells. The film F, as it unwinds from the reel R₁ onto the reel R₂ passes

in front of the disk D, and as closely as is practicable to it so that the film and the disk holes are in focus together on S.

If, with the apparatus as just described, the film stands still, with a picture frame exactly filling the field aperture in front of the disk, and the disk rotates at its normal speed for television, the screen S shows a projected image of the film, colored if the film is colored, and capable of being picked up by the photoelectric cells and transmitted, to be received like the image of a colored object by the single disk, three-lamp receiving apparatus, as ordinarily used for this purpose. When the film is moved in order to give a motion picture, there are two alternative forms of scanning disk available, depending on whether the motion of the film is intermittent, as in most cameras and projectors, or continuous. In the first case, a scanning disk must be used with a blank sector corresponding to the period occupied by the shift of the film between frames, as shown in D₁, Fig. 2, and a similar disk must be used at the

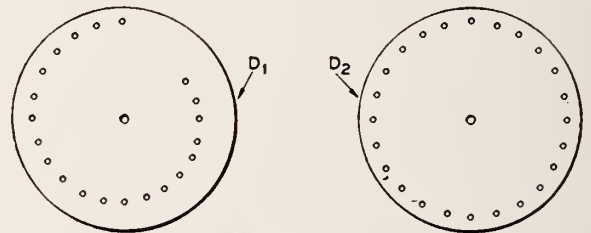


Fig. 2

receiving end also. The use of intermittent exposures is, however, not only inefficient, because of the waste of line-time during the blank period, but is quite unnecessary when the image is analyzed by successive passages of a scanning aperture across the field. Instead of a disk provided with a spiral of holes it is simpler and better to use a disk with the scanning holes arranged in a circle, as shown at D₂, Fig. 2, and to give the film a uniform and continuous motion along the vertical diameter of the disk. When this is done the screen S shows merely a horizontal strip of light (indicated in Fig. 1 by the solid line) but the usual spirally-perforated disk at the receiving end spreads this out into a complete picture.

This method of transmitting colored images from motion picture film, while completely practical, suffers under the disadvantage that it requires an original colored film of a sort which is both expensive and time-consuming to produce. Should television transmission from film become popular it is probable that the chief demand would be for films which would be shown but once, and for showings within a few hours, at most, of the event. Some form of colored film would then be called for which could be prepared quickly and cheaply, and the film process need not be one adapted for making numerous copies.

A form of colored motion picture which very completely meets these requirements is produced by the Kodacolor process.² In this the image is black and white, but is distributed into a triple linear mosaic by lenticular ridges on the film. Exposure is made through a lens with three apertures, and pro-

jection is accomplished through a lens similarly equipped with three apertures, covered with red, green, and blue filters. The original negative, made into a positive by a process of photographic reversal, is used for projection. There is but one film available, but this is all that is necessary for the use in television which we are considering. The film is cheap as compared to a film in which the color is added by a dyeing process, and the time required to prepare it for projection is a matter of hours instead of days.

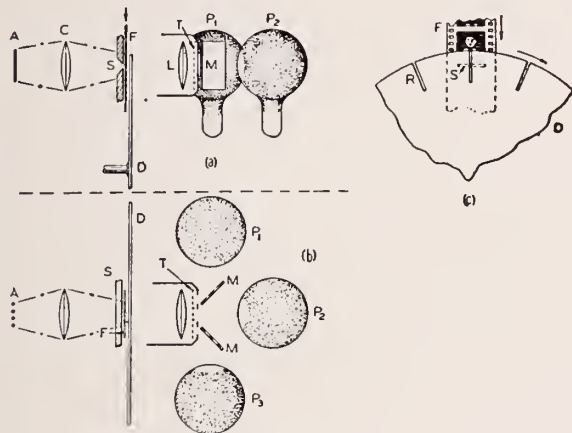


Fig. 3

The method of using Kodacolor film may be most comprehensively described by saying that the film is to be projected as though for display upon a screen, but that the three beams of light issuing from the projection lens are directed each into a separate photoelectric cell for television transmission. With the details of the apparatus shown in Fig. 1 in mind, the Kodacolor film arrangement is readily grasped from Fig. 3, where the upper view (a) shows the elevation, the middle view (b) the plan, and (c) shows a detail of the scanning disk and film. Starting with the light source A, the light is condensed by the condenser system C on the film F which moves continuously past the slot S and directly behind the disk D. The disk is shown as provided with radial slots R, these together with the fixed slot S forming the scanning holes. After passing through the film and disk the light is projected as if to a screen by the lens L, in front of which is placed, in the regular projector, the set of red, green, and blue filters T. For our purpose both the screen and the filters are dispensed with. After passing through the lens, the light is diverted into three photoelectric cells, P₁, P₂, and P₃, by the mirrors M. These cells are all similar, and need not be color-sensitive. The filters are omitted as obviously unnecessary—color is not needed until the signals are received and recombined at the receiving disk where the same apparatus is used as for the reception of signals from original colored projects.

The arrangement of apparatus shown in Fig. 3 calls for the slot, film, and disk being practically in contact. This condition, which must be met if color fringes are to be avoided, is likely to offer some difficulty, since both are moving at high speed. An alternative arrangement, by which the disk and film are separated, is shown in Fig. 4. Here the symbols are as in Fig. 3, and the apparatus is the same from the lamp A to the film F. The disk is, however, removed to a new position beyond the projection lens L₁, which is supplemented by a short-focus lens L₂ so that an image of the film F, where it lies over slot S, is projected onto the disk. A third lens L₃, close to the disk, images the three apertures T onto mirrors M and photoelectric cells P as before. By this means the film image may be placed accurately in the plane of the disk and color fringes

avoided.³ Additional advantages are that the disk may be made of any convenient size, and that the radial slots to which one is practically driven by constructional difficulties in the very small disk may be replaced by holes as shown at (c).

In describing the apparatus for achieving television in colors by a beam-scanning method¹ emphasis was placed on the fact

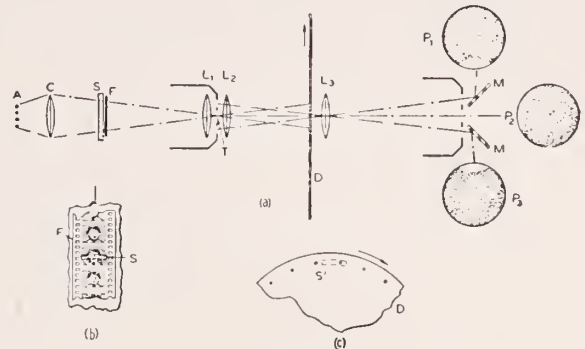


Fig. 4

that the same single scanning disk was used at each end as for monochrome work. A similar characteristic holds for the film apparatus here described. Either color or monochrome film can be used interchangeably, the latter requiring but one transmission channel. If monochrome receiving apparatus only is available when multichrome film is used, it may be received as monochrome, preferably selecting the green channel as giving nearly orthochromatic effects. If three-color receiving apparatus is available of the form previously described¹, images from monochrome film may be received on all three (red, green, and blue) lamps together, adjusting their relative intensities to give white or any other desired color for the resulting monochrome image.

References

- ¹ Ives, H. E.: "Television in Color by a Beam-Scanning Method," *Jour. Opt. Soc. of America*, 20 (January, 1930), No. 1, p. 11.
- ² *Photographic Journal* (September, 1929), p. 402.
- ³ The disk and film could be similarly separated in the form of apparatus shown in Fig. 1 although the necessity is not so apparent.

(The above article appears here through the courtesy of The Journal of the Society of Motion Picture Engineers—Editor.)

New Natural Color Idea Discovered in England

A NEW process for the production of motion pictures in natural colors and printed on non-inflammable film has been discovered, according to the producers, who have shown samples of the film to the Royal Society, premier scientific body of England. It is claimed that the natural color is produced on a film base printed with a foundation, or matrix, consisting of a half-million minute red, green and blue squares to every inch of film. Over this foundation, is a coat of highly sensitive emulsion.

Consolidation

CONSOLIDATION of the Warner Bros. and First National production department, with Darryl Zanuck as executive in charge of both companies, is announced by Jack L. Warner. Hal Wallis and Lucien Hubbard will be associate executives, while C. Graham Baker heads the scenario department.

Hal Hall

SAYS

Thanks Mr. Carroll

MORE and more notice is being taken of the Cinematographer by those who write for the public press; which is as it should be. The latest film writer to really give the cameraman a break is Harrison Carroll, whose very able work appears in The Los Angeles Evening Herald and many other papers using the Premier Syndicate service. We reprint herewith Mr. Carroll's remarks.

"More recognition is given these days to cameramen, but they still are comparatively unsung heroes.

"With the development of the amateur movie cameras, the public is taking the initial step towards correcting this injustice. Some of the best known cameramen are receiving as many as 100 fan letters a week, asking technical questions. If an unusual effect appears in a picture, it is the signal for a barrage of inquiries.

"These range from the simplest to the most complicated matters of technique. Double-exposures, fade-ins, cloud effects and backlighting are favorites. Another baffling effect to amateurs is what the industry knows as the 'moving dolly shot.' Many amateurs walk in towards the photographic subject and cannot understand why their pictures are bumpy. In the studio, of course, evenness is obtained by the camera being bolted to a moving dolly.

"John Arnold, president of the American Cinematographers' Society, is a leading figure in the cameramen's battle for recognition. 'Why shouldn't we get a credit?' he asks. 'Who makes it possible for stars to build reputations for beauty and ability. A star can give a rattling good performance, but if she is badly photographed it becomes mediocre in the eyes of the public.'"

Service

WHILE listening to some of the very interesting papers being read at the S. M. P. E. meeting the other week the thought struck me very forcibly that mighty few people who receive the greatest benefit therefrom appreciate the vast amount of work these engineers do, from an entirely unselfish motive. Some of those papers required months of research and preparation. But the authors toiled steadily at their work, always with the aim to improve the picture industry. Too little credit is given the technical men as a whole. This applies to all branches of the technical division. Volumes are written about the stars, even about the wardrobe workers—but oh, so little is said about the cameramen, sound engineers, laboratory workers, electrical geniuses and that vast army of men who toil ceaselessly in the research laboratories on experimental work. Some may say that the public does not want to read about the technical or scientific. But that is not so—witness the fact that the editors of the greatest daily papers place new scientific discoveries on the front page.

This and That

A DELIGHTFUL note was sounded the other day by Jack L. Warner when he made it known that plans of the Warner Brothers-First National Studios call for continuous production during twelve months of the year. No layoffs or enforced vacations there in immediate future. Sweet music to many ears . . . One of the most dignified gentlemen we have met is John Crabtree, genial president of the Society of Motion Picture Engineers . . . It is really an inspiration to see how calm he remains under the most exciting conditions . . . Hope the Society of Motion Picture Engineers makes a regular feature of the exhibit of motion picture equipment . . . Only—someone should see to it that attractive booths are provided for the exhibitors and that the exhibit does not make one think that a moving van just dropped off a load of apparatus . . . This exhibit could, and should, be one of the big features of the conventions . . . Where else would you expect to find such an exhibit . . . we ask you . . . More recognition for cameramen, is the slogan of President John Arnold of the American Society of Cinematographers . . . with a man like Arnold leading the way, the cinematographers will get it, too . . . watch him . . . Wonder what kind of people crowd into houses that show two features at one sitting . . . Even Harold Franklin says now that he believes they tire of them . . . He ought to know, for he gives them to them . . . Wonder what studio gatemen think about . . . they always seem to be buried in thought—and self importance.

Figure It Out Yourself!

WE REPRINT herewith a news item sent out by the Associated Press. This story speaks for itself and should answer the questions of the vast army of men and women who are afflicted with the yen to come to Hollywood and take a chance at getting into the picture game:

WASHINGTON, May 13. (A.P.)—The changed status of the Hollywood extra as a result of the talking films was the subject of a warning today from the Woman's Bureau of the Department of Labor. In a news letter to labor union officials and women's organizations in all the States, the Woman's Bureau laid stress on the present plight of those who once made up the mob scene of the pretalkie "superspectacle."

Of 17,541 extras registered in Hollywood in 1930, the letter says, only 833 averaged one day's work a week or more. Of these, ninety-five averaged two and one-half days a week. None could claim the record of having daily work.

Their pay is quoted as follows: "13.5 per cent worked for \$5 a day; 36.56 per cent for \$7.50 a day; 43.23 per cent for \$10 a day, and approximately 5.5 per cent in excess of \$10 a day. The average daily placement of men for 1930 was 545, of women, 243, of children 19.

"Those who dream dreams about the financial returns from residence in the motion-picture city are invited to ponder the official figures," the Woman's Bureau quotes from a report of the California State Department of Industrial Relations. "These totals, gleaned from experiences, sad and otherwise, should give pause to the fond mother whose ambition is to train her child for a place in the Hollywood sun."

A. S. C. Conducts Fast Film Tests

by **WILLIAM STULL, A. S. C.**

SINCE the introduction of the new Super Sensitive Pan-chromatic Negative emulsions by the two outstanding manufacturers of motion picture film, the subject of "Fast Film" has been one of paramount interest and importance to the cinematographic world. Accordingly, the American Society of Cinematographers has undertaken a programme of exhaustive research into the practical applications of the new product. A series of exhaustive tests are now under way, treating every phase of the problem, and leading toward a definite series of recommendations from the Society dealing with every phase of fast film practice. They will embody the experience of the Industry's leading cinematographers, as gained both from photographic and laboratory tests and from actual production experience, and, as such, will form the final word from the Industry's photographic experts upon this new photographic problem. In making and presenting these tests, the Society has enjoyed the fullest cooperation from the authorities of all studios, the film manufacturers, and from the Technicians' Branch of the Academy of Motion Picture Arts and Sciences.

The Fast Film Test programme, when completed, will include complete sensitometric data concerning the films, and photographic tests embracing every problem encountered in production. Among the subjects of these special tests are: Color Rendition; Filtering; Interior Lighting; Special Effects; Lighting Equipment; Makeup; Laboratory Practice; Working Conditions on the Set, with both old and new films (with particular attention paid to the temperature of the set); and many other problems. These tests will be accompanied by representative scenes from current productions which have been photographed on the new films. Accompanying these

will be a series of definite recommendations concerning these various matters.

Many of these tests have, at this writing, already been completed. Those that have thus far reached completion have been exhibited before the membership of the American Society of Cinematographers at a series of special meetings which have been held for the purpose, and at which the whole membership participated in informal discussions of the projects, and of the use of Fast Film in general. A preliminary programme of these tests and production scenes, to the extent of more than ten reels, was exhibited at the last meeting of the Technicians' Branch of the Academy, on May 21. An abridged programme has also been exhibited before the Society of Motion Picture Engineers at their recent convention in Hollywood.

The making of these tests was supervised by President John Arnold, and was carried out by various members of the Board of Governors, of the Society's Research Committee, and of the membership at large. Among the cinematographers whose work, either in the form of special tests, or in actual production scenes, has appeared in these programmes so far, have been: Clyde de Vinna; L. William O'Connell; Elmer G. Dyer; Hatto Tappenbeck; Charles Rosher; Merritt B. Gersted; Hal Rosson; Gordon Avil; John F. Seitz; Dan B. Clark; Victor Milner; Virgil Miller; Karl Struss; Lee Garmes; Roy Hunt; Edward Cronjager; Ernest Palmer; Hal Mohr, and many others. The sensitometric data was compiled by Emery Huse, A.S.C., Gordon Chambers, and others.

A complete report of the findings and recommendations arising from these tests will be published in an early issue of the "American Cinematographer."

Work of R-K-O Technicians Makes Hit in England

"SALLY in Our Alley," first picture turned out by Associated Talking Pictures, Ltd., British unit headed by Basil Dean, for R-K-O release, has been completed and the technical work by three Radio Pictures technicians sent over here has received much praise. The trio includes Bob Martin, chief cameraman; Otto Ludwig, cutter, and Raymond Friedgen, co-director. "Footsteps in the Night" is the second production being made.

Secret Processing Device Being Launched in England

A COMPANY has been formed in England under the title of Armoured Films Manufacturing Co., Ltd., with the declared object of "acquiring an exclusive license to armour or strengthen cinematographic films within the British Isles under patents owned by Armoured Films, Ltd. Directors are M. R. Proudlock, F. L. Crilly, I. S. Miller and W. L. Shepherd. The company is closely guarding the nature of the process.

To Record African Dialects

AN EXPEDITION, headed by Marcel Grauel, noted scientist, and backed by the Rockefeller Foundation, has left Paris for the African jungle for the purpose of recording on phonograph discs native dialects and music.

Boyle to Sweden

JOHN W. BOYLE, second vice-president of the American Society of Cinematographers, and one of Hollywood's best known cinematographers, left for Sweden on May 24. He will be gone until late next Autumn or early Winter. Mr. Boyle will make a series of scenic pictures covering Sweden, Norway, Denmark, Finland and Lapland. He took with him Ray Fernstrom, whose exploits as one of the ace cameramen of the Paramount Newsreel have made him famous.

Round the World

TO GATHER material for a new Technicolor shorts series, known as "Color Magazine of the Screen," Welshay Pictures, Inc., headed by Robert E. Welsh and J. Frank Shea, will shortly send a unit, headed by Duke Green, cameraman, on a 'round-the-world trip. Welsh and Shea are now producing "Beauty Secrets of Hollywood," Technicolor shorts, for Paramount release.

New Studio Sound Outfit

OF UNUSUAL interest is the new studio sound recording outfit which is announced in this issue of the Cinematographer by the Radio Installation Company. This outfit is said to provide excellent sound for small independent producers at a figure within the reach of all. The next issue of the Cinematographer will contain a complete story dealing with the details of the new equipment.

Laboratory Department

Conducted by EMERY HUSE, A. S. C.

Principles of Sensitometry and Their Practical Application

[This is the second installment of the instructive article on practical application of sensitometry which has been written by Mr. Huse, Technical Editor of this Journal. The first part appeared in the May issue.—H. H.]

IT WOULD be well at this point to give some consideration to the processes of film manufacture. In the preceding article mere mention of the discovery of film base was made, but it is of major interest to know those things which go into the manufacture of film base. The base of all film is a cellulose product and the most necessary and important ingredient in it is cotton. One of the first steps in preparing film base is the washing and drying of the raw cotton, which process takes weeks.

Following this washing process the cotton is treated with a mixture of nitric and sulphuric acids, which process renders the cotton soluble in alcohol. This treatment gives us what is technically known as "cellulose nitrate." This treatment with the two acids, although it does not alter the physical appearance of the original cotton, does, however, change it chemically so that it will be soluble in the various mixtures which would have no effect upon the unnitrate product. Wood alcohol is the chief solvent used in this process. This action again covers a rather long period and the solution which finally results is a relatively clear one having the consistency of honey. This solution, often referred to as "dope," is then poured on the surface of great polished wheels which run consistently night and day. These are the dope casting machines and give film base in sheets which are approximately 40 inches wide and 2000 feet in length. The standard thickness of film base is from .005 to .00525 of an inch, and the degree of accuracy obtained is such that the variation does not exceed .00025. This base is handled in large rolls in a manner similar to which rolls of printing paper are handled, and in this condition is sent to be coated with the light sensitive emulsion.

The photographic emulsion is that light sensitive surface which reacts to the action of light. This emulsion, of course, can be varied in its chemical setup to give the various types of film available on the market—positive, negative, duplicating, and sundry others. The chief element in the emulsion is silver. The bars of silver are dissolved in nitric acid in porcelain dishes and after crystallization pure crystals of silver nitrate are obtained. Other ingredients of the emulsion are potassium iodide, potassium bromide, and gelatin. Gelatin is the substance in which the ingredients of the emulsion are prepared so that this emulsion may be subsequently coated onto the film base. Photographic gelatin is usually prepared from calf skin by soaking the skins in lime water and subsequently extracting with hot water. The gelatin is dissolved in water and the bromide and iodide solutions carefully mixed with it. This mixture, heated to the correct temperature, has added to it the silver nitrate solution. The precipitate of the sensitive silver salt is held in suspension by the gelatin, and because of this the term "emulsion" is derived.

The foregoing has been discussed for the prime purpose of giving the reader some idea of how photographic emulsions are made.

An Historical Review of Sensitometry

Sensitometry literally means a measure of sensitivity. As early as 1848 Claudet devised an instrument for determining

the speed of the daguerreotype plate, which instrument was termed a "photograph meter." By the aid of this meter one was able to determine the exposure necessary to produce a visible impression on the sensitive material. This method was extremely crude and was not very reliable, but it no doubt laid the foundations for the work which was carried on some years later by two men in England, Hurter and Driffield, who were amateur photographers, but whose prime interest in photography was the production of images which were true to nature. In January, 1891, Ferdinand Hurter states in the opening sentence of his paper, "The Action of Light On the Sensitive Film," that "the function of photography is the production of permanent images of material objects as true to nature as possible." Hurter's use of the words "sensitive film" must not be taken literally, as he used the word film to represent that layer of sensitive material which was coated on a glass plate.

Ferdinand Hurter was a Swiss who began the study of chemistry at an early age, which later led him to be apprenticed to a dyer, in which practical field of chemistry he achieved notable success. He went to England some years later where he eventually became chief chemist and technical adviser of the United Alkali Company.

Vero C. Driffield, an Englishman, though intending to become an engineer, became interested in the practice of photography. His engineering studies, however, led him eventually to join the same firm with which Hurter was connected, and the two men became great friends. Hurter acquired his interest in photography due to Driffield's continual experiments in this general field, and for several years these two men worked together in an attempt to study the underlying principles of the action of light on a light sensitive material. It must be remembered that at this time the collodion plate was practically the only sensitive material at the disposal of the photographer. It was known generally that the photographer had to expose his plate to suit the light, and great difficulty was experienced in the early stages of photography in the estimation of the correct exposure. Naturally, there was much guess work connected with photography of that day. Hurter and Driffield's first problem, as they saw it, was to devise some means of accurately measuring the actinic power of daylight. This work led to the discovery of their actinometer, data on which is incorporated in a specification drawn up by Hurter on the 23rd of April, 1881. For several years the attention of these two men was absorbed by the general subject of actinometers.

In May, 1890, the first joint work of Hurter and Driffield was published under the title "Photochemical Investigations and a New Method of Determination of the Sensitiveness of Photographic Plates." This paper led to a discussion of negative density, opacity, and transparency; means of measuring densities; study of development; gradation, which was referred to by these men as the "ratio of the densities," intensification, and reduction; ending finally with speed determination of sensitive plates.

It was Hurter and Driffield who devised the means of graphically showing the action of light on a photographic emulsion by plotting density produced on a negative against the exposure causing these densities. This constitutes the origin of the so-called H and D curve, which letters refer specifically, of course, to Hurter and Driffield.

New Eastman Sensitometer

(Continued from page 15)

slots in the drum have passed the exposing apertures. This selector shutter is connected to a one turn mechanism which is driven by a shaft directly connected by a pair of spur gears to the shaft carrying the rotating drum, D. The one turn mechanism is actuated by the bottom, B, thus opening the aperture O at the proper instant and closing it again after the desired exposures have been made.

Supplied with this instrument are two calibrated lamps, one for use in exposing positive film and one for negative film. The effect current in amperes, the voltage tolerance, and the distance at which the lamp must be set to produce the standard illumination on the exposure plane, are furnished with each lamp.

The current flowing through the filament of the standard lamp is controlled by the rheostat and its value is indicated by the ammeter. A volt meter is also provided in order to detect any lamp deterioration which might affect the constancy of results in precision work.

The lamp for positive film is standardized for candlepower when operating at a color temperature of 2600° K. Since this quality of illumination is probably somewhat yellower than that used on the average in the practical exposure of positive film, a selectively absorbing filter is provided which raises the color temperature and the radiation incident on the exposure plane to approximately 3000°K. The lamp for exposing negative film is standardized for candlepower at 2360°K. and with this lamp is used another filter which raises the color temperature of the radiation incident on the exposure plane to approximately 5400°K. (mean daylight).

The exposure drum which controls the time factor of the exposure, to which the various areas of the photographic material is subjected, consists of a thin sheet of metal cylindrical in form, one end of which is mounted on and supported by a heavy cast iron wheel fixed directly upon the shaft of the reducing gears. In this cylinder are cut a series of 21 openings, each 10 mm. wide, the narrowest of which has a length as measured upon the circumference of the cylinder of 1 mm., while the longest has a length of 1024 mm. The length of these openings form a logarithmic series, each one being the square root of two times as long as the adjacent shorter one.

The sensitometer is designed for operation on an alternating current line of approximately 110 volts, either 50 or 60 cycles. If the line voltage is unsteady, it is desirable to use some form of voltage regulator, which addition can be obtained at relatively little increased cost.

The actual operation of the instrument consists first of inserting and connecting the proper lamp. The lamp switch is then thrown on after having made proper precaution that the proper filter for that lamp is inserted in the filter holder.

The main switch of the instrument is then turned to the ON position.

The lamp current is set at the calibrated value by adjustment of the rheostat knob.

After the lamp has reached a steady value of current and no further adjustment is necessary, the film is inserted into the exposure slot and the platen is pressed down on the film until it locks. The release button is then pressed.

The completion of the exposure is indicated by a bell signal.

The foregoing has given a rather brief description of this instrument, but as there is one of these instruments in the local Laboratory of the Eastman Kodak Company, it is available for inspection at any time. It will undoubtedly be of interest to state that the price of this instrument complete is \$750. f. o. b. Rochester.

Every instrument of this type placed in the motion picture field will be kept thoroughly standardized at all times by the local Kodak Laboratory. In this way a photographic standard can be arrived at in the motion picture industry.

A Non-Intermittent Camera

(Continued from page 12)

The optical system of this camera—aside from its unique optical shutter—is noteworthy, in that no important part of the camera is moved at all in focusing, and that it is absolutely impossible to photograph a scene with the camera in the focusing position. As may be inferred from the foregoing description of the optical shutter-wheel, the aperture is laterally offset from the primary path of film-travel from the magazines. This space is utilized in the focusing system, which consists of a prism which slips into place just in front of the aperture, and reflects the image onto a ground-glass focusing screen, from which it is again reflected through a conventional magnifying focusing-tube system to an eyepiece at the rear of the camera. This focusing prism is slipped into place by depressing a small button at the side of the camera, and it is **automatically** thrown clear of the aperture whenever the camera is started.

Combined with this unusual focusing arrangement is an absolutely unique device known as the "Exposometer." This is simply a very practical exposure-meter built as an integral part of the camera. It consists of a small photo-electric cell into which the light-beam from the lens is reflected, and which actuates a needle upon a dial at the rear of the camera: when the lens and shutter are so adjusted as to keep this needle within certain marks upon the dial, the **overall** exposure of the scene will be approximately correct. This device should be invaluable when working on location, and amid unfamiliar light-conditions, though it cannot, and does not, of course, attempt to dispense with the expert cinematographer's judgment of highlight and shadow balances, etc.

A peculiarity of this type of camera is that, lacking either an intermittent movement of film past the aperture, or a true shutter, it cannot, of itself, produce the effect of a frame-line in its pictures. Were its films always to be projected upon similarly constructed, non-intermittent projectors, this would be of no consequence, but as its product must be suited to all types of projection apparatus, an artificial frame-line must be produced. This is done by an ingenious masking device incorporated in the matte-box, which is set after focusing and lens-aperture setting has been done, and which brings a pair of horizontal flaps in the matte-box into the proper position to mask off sufficient of the top and bottom of the frame to provide a fair frame-line. Incidentally, this arrangement should also be very valuable when working in extreme back-lights out of doors, as a sun-shade.

A further interesting feature of this camera is the film-magazine. For while it may be used with conventional Mitchell and Multicolor magazines, its own magazine is of a type that though it has not for some time been in use in this country, has many practical advantages. The Moreno-Snyder magazines are, at first sight, of the conventional double type, with separate retorts for exposed and unexposed film. But, while these retorts are used in the double unit, each retort is removable, and both are interchangeable, making it possible to greatly reduce the equipment carried on long location trips, and likewise making for great convenience in trick work, multiple-exposures, and camera lap-dissolves.

Inasmuch as there is no intermittent movement in this camera, and since the few moving parts are all in continuous motion, the camera is almost perfectly noiseless at normal operating speeds. Its range of practical operating speeds, incidentally, is enormous, ranging from a minimum of 8 frames per second to a maximum of more than 300 frames per second (over 1,000 feet per minute), with a possibility of even higher speeds being attainable if adequate driving-motors are used. This is, naturally, a considerable advantage for both high-speed and sound photography, while the continuous movement of the film offers obvious advantages to portable, single-film recording systems.

(Continued on page 44)

New Angles on Fast Film

(Continued from page 13)

film helps us to do it. First, of course, it enables us to deliver a better photographed picture; but that isn't the only thing: it enables you to use fewer and smaller lights, and let the actors work more comfortably. And since you are using fewer lights, it enables you to work faster. You know what that means. It minimizes the mechanical element; it means that if you have two successive shots to make, with two different set-ups, but with the same actor, you can shift your set-up quicker, and get those two scenes closer together, while the actor is in the same mood; before his train of thought is broken. That's the important thing—to so minimize the mechanical element that we can enable the actor to work quickly and consecutively, and to give the best interpretation of his part of the story. You've done wonders already with this in your first picture on the new film, but I don't believe that we'll reap the full benefit of it for several months—until the handling of it becomes as completely second nature to you as has been the handling of the old film to which you are accustomed. Once that stage is reached, I don't know what new heights we can't reach!"

And so it went, all along the line. Last of all, I asked myself just how and where this new film aided me in my work. The reactions of the various other members of the company had opened up a new line of thought to me, for I had not previously realized how much the incidental benefits of improved working conditions—which, in comparison to the improved photographic results, seemed minor, to me—might mean to the other members of the company. To the cameraman, if you can work faster and more comfortably, so much the better; but if you can secure better photographic results—there is improvement!

And in addition to working faster and with more comfort and therefore greater efficiency for all concerned, this new film makes possible a tremendous increase in photographic quality. The first purely photographic quality which we think of in connection with this so-called "Fast Film" is its speed; but, properly considered, this is probably the least of its advantages. Unusual overall sensitivity is of little real importance in studio use, except as it enables a reduction in the amount of lighting equipment used, and thus improves the working conditions on the set. But there can be no substitute for improved color-sensitivity. The color sensitivity of this new emulsion is truly a great improvement over that of the old. It is much more uniform, and closer to the sensitivity of the human eye. In other words, colors now photograph more nearly as we see them. Furthermore, this new film has inherently a color correction which approximates somewhat the correction obtained on the old type of film with a K-3 filter. This, however, is a rather haphazard way of putting it; but it gives us an approximate index as to what we can expect. From it we can at least get an idea of where we start: that is, with a film which has the same general chromatic advantages as the older film with the filter stated, but without the overcorrection frequently noticeable. From it we can also at once determine that the K series of filters will be useless on the new emulsion, but that the Aero filters, the various orange, red, and neutral-density filters will be useful, but in degrees, considerably different from what we were accustomed to with the old film. This means that we must make special tests if we are going to work out of doors with the new film. Naturally, there are going to be conservative souls who will prefer to use the old type of film for exteriors, and the new type for interiors, where its advantages in regard to speed, etc., make it almost indispensable. I have no quarrel with such methods, but it seems to me that in temporizing this way they are putting themselves to a vast deal of unnecessary trouble. It seems to me like buying a sixteen-cylinder car, and

then cutting out half the motor for city driving, on the grounds that the full power of the sixteen is not needed while driving about town. You are not saving yourself, or your company anything, but, rather, making yourself a great deal of extra trouble in the matter of matching up your photographic quality, your actors' makeups, etc., between the two films.

Besides, to my mind, the greatest advantages of the new film come in exterior work. In the long series of tests which I have made on exteriors with it, I have not yet found any way to make this film give an unpleasantly harsh, contrasty picture. You can over-correct upon it, but you cannot make it go contrasty. And even under the most absurdly impossible filter and exposure combinations, and for night-effects, it will still give a naturally soft picture, with surprisingly luminous shadows, and soft (not chalky), highlights. Its latitude is a constant source of surprise to me.

Even without filters, it is surprising what the film will do in the way of cutting through the haze of distant landscapes. It will pierce haze that the naked eye will not, yet at the same time keep a nice atmospheric balance. With filters, it is sometimes embarrassing, however, for with these aids it will ruthlessly rip its way into the distance and reveal more than you have bargained for.

Super sensitive film is a most amazing aid to the user of long focus lenses, too. Such lenses have, as most cinematographers know, a disconcerting habit of giving a flat picture at times, unless the exposure and lighting are very accurately managed. But this new film goes a great way to eliminate this trouble. I have made tests with extreme telephoto lenses and this film, panning my camera so that the light through the shot changed from a straight cross light to a perfect back-light; and at all times the shot stood out as crisply and nicely as though it had been done with a normal lens.

The benefits of Super-sensitive film for interior use have been too fully written of to require even a brief mention here: so, to sum up my answer to my own question of the benefits that super-sensitive film can bring the cameraman, I find myself agreeing with Mr. Reisner in his opinion that it is a long time before we cameramen can know the full answer to this question, for the possibilities of the new film are so vast that, for many a long month—or, more likely, year—we will all of us be experimenting to find just what the limits of them are. When we at last do find them, we shall have made tremendous strides both artistically and technically in cinematography, and, until then, the new film will give us an added interest in our work, for we shall be learning something about it and about cinematography every day. And, after all, that is what makes our work most interesting, is it not?

Aiding the Deaf

TWENTY-TWO additional theatres have had Western Electric Audiphones installed for the hard-of-hearing by Electrical Research Products. They are:

The Jefferson, Beaumont, Texas; the Babcock, Billings, Montana; the Capitol, Dover, Delaware; the Granada, Duluth, Minnesota; the Strand, Fairmont, Minnesota; the Texan, Houston, Texas; the Fox Watson, Salina, Kansas; the Rivoli, La Crosse, Wisconsin; the Knickerbocker, Nashville, Tennessee; the Rivoli, San Benito, Texas; the Texas, Seguin, Texas; the Orpheum, Tulsa, Oklahoma; the Ritz, Tulsa, Oklahoma; the Alcyon, Highland Park, Illinois; the Redondo, Long Beach, California; the Wilshire, Santa Monica, California; the Miller, Wichita, Kansas; the National, Louisville, Kentucky; the Arkansas, Little Rock, Arkansas; the Elks, New Iberia, Louisiana; the Stamford, Stamford, Connecticut; and the Grand Opera House, Dubuque, Iowa.

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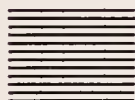
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Lester Cowan Appointed Academy Executive Secretary



THE DESIGNATION of Lester Cowan as Executive Secretary of the Academy of Motion Picture Arts and Sciences was announced last month. This action was taken by the Academy Board of Directors at their last meeting.

Mr. Cowan has served as Assistant Secretary of the Academy since he became associated with the motion picture industry in 1928 after previous experience in the field of business research. Increased responsibilities devolved upon him following the recent resignation of former Secretary Frank Woods to accept a studio position.

For the past two months Mr. Cowan has been assisting in the negotiations between screen writers and producers leading toward the establishment of standard contracts similar to the Minimum Contract for actors successfully administered by the Academy.

When the coming of sound revolutionized the technical aspects of motion picture production, Mr. Cowan was active in the program through which basic research was undertaken on behalf of all the studios under the Producers-Technicians Committee of the Academy. The aim of this work is to use scientific methods and economic management to increase efficiency and reduce waste in the technical processes of production. Through the Academy the various studios cooperate on problems common to all.

An educational development last year was the organization of courses in the studios for the education of 900 selected employees of the different departments in the new technique required for sound pictures. An authoritative reference volume "Recording Sound for Motion Pictures" is now being published as a continuation of this educational program.

The establishment of a Standard Release Print is a recent technical accomplishment of the Bureau. Resulting in a smoother show in the theatres and making possible the abandonment of cue sheets and reduction in film mutilation, it represents an annual saving of several hundred thousand dollars to the industry.

Studies are also being carried on to secure greater efficiency in film processing, studio lighting, and the solution of other immediate studio problems.

S. M. P. E. Convention

(Continued from page 11)

A number of improvements are described which assist in giving the desired conditions. Among them are a cooling coil for adjusting the temperature of a developer, a new type of rack guide for a developer tank, a compact light lock, a water-proof and corrosion-resisting portable darkroom lamp, and some auxiliaries for the prevention of spots and contamination on film.

Improvements in printing room equipment include the addition of a flywheel to a continuous printer to eliminate unevenness in exposure due to variation in the motion of the film during exposure. Also, a light change has been equipped to control either of two lamps of different wattage giving in each case exposure values which have exactly equal relationships.

Some modifications have been made in rewinding equipment which have for their object the prevention of ground noise and damage to the picture and which result from cinching of badly wound film rolls.

A film storage cabinet has been designed for laboratory use which gives an increased degree of protection from fire and water at the same time assisting in the convenient and orderly arrangement of the film.

The laboratory symposium continued throughout the afternoon with the following papers in order: "A Directional Effect in Film Processing," by J. Crabtree, Bell Telephone Laboratories. "Straight Line and Toe Records with the Light Valve," by D. MacKenzie of ERPI. "A Motion Picture Laboratory Sensitometer," by Dr. L. A. Jones of the Eastman Kodak Company. "Two Special Sensitometers," by D. R. White of the DuPont-Pathe Film Manufacturing Company. "Electrolytic Regeneration of Motion Picture Fixing Baths," by K. Hickman, C. R. Sanford and W. Weyerts of the Eastman Kodak Company. "Automatic Control of Electrolytic Recovery Apparatus," by K. Hickman of the Eastman Kodak Company. C. H. Dunning of Hollywood, then gave a paper on "The Dunning Process and Process Backgrounds."

Friday again saw numerous papers presented. They follow:

"An Apertureless Optical System for Reproducing Sound on Film," by R. C. Burt, R. C. Burt Scientific Laboratories, Pasadena, Calif.

"Continuous Non-Intermittent Projectors," by A. J. Holman, East Orange, N. J.

"Properties of Low-Intensity Reflecting Arc-Projector Carbons," by D. B. Joy and A. C. Downes, National Carbon Company, Cleveland, Ohio.

"An AC-Operated Sound Motion Picture Reproducing Equipment," by T. D. Cunningham, R-C-A Victor Company Camden, N. J.

"Motion Picture Screens," by F. M. Falge, Beaded Screen Corp., New York, N. Y.

"Noise Measurement," by S. K. Wolf, Electrical Research Products, Inc., New York, N. Y.

"Measurements with a Reverberation Meter," by V. L. Chrysler and W. F. Snyder, Bureau of Standards, Washington, D. C.

"The Rapid-Record Oscillograph in Motion Picture Studies," by A. M. Curtis, C. H. Rumpel, and T. E. Shea, Bell Telephone Laboratories, New York, N. Y.

"Application of Optical Instruments in the Motion Picture Industry," by I. L. Nixon, Bausch & Lomb Optical Company, Rochester, N. Y.

"The Ribbon Microphone," by H. F. Olson, R-C-A Photophone, Inc., New York, N. Y.

"A Moving-Coil Microphone for High-Quality Sound Reproduction," by W. C. Jones and L. W. Giles, Bell Telephone Laboratories, New York, N. Y.

(Continued on page 45)

.. In the Realm of Sound ..

New W. E. Microphone

A NEW Western Electric microphone operating on a principle similar to that of the first telephone transmitter used by Alexander Graham Bell is announced by Electrical Research Products for use in recording talking pictures. The microphone, already in use in a number of studios and known as the Western Electric Electrodynamic transmitter, possesses many improvements over the condenser type microphone generally used in recording until now. The new transmitter is a development of the Bell Telephone Laboratories.

Its use eliminates several recording problems; one of which has been the difficulty in hiding the microphone from the view of the camera. The new microphone is smaller and its associated amplifier may be located as far as two hundred feet from the microphone making it much easier to hide from the view of the camera. The amplifier for the condenser microphone was built as an integral part of the microphone housing and made it extremely difficult to camouflage in many sets.

Other advantages of the new transmitter are that it is less affected by dust and moisture and need not be kept in a desiccator. It is unaffected by changes in temperature and barometric pressure. It is a further contribution in noiseless recording since its associated amplifier is quieter in operation. The transmission characteristics of the transmitter are superior and distortion caused by cavity resonance has been practically eliminated thus increasing quality and reality in recording. Increased volume is obtained since the transmitter and associated amplifier give from 10 to 15 decibels more overall gain than the condenser transmitter and amplifier.

The principle on which the transmitter operates is the inverse of that employed in the well known Western Electric 555-W receiver used in the Western Electric Sound System. In this receiver or any dynamic loud speaker the magnet system is so constructed as to produce a circular air gap, across which extends a radial magnetic field, between the inner pole and the surrounding outer pole. In this air gap is situated a thin circular coil which is attached to the diaphragm. If a sound current is passed through this coil, the electrodynamic reaction between the current and the field will cause the coil to execute axial vibrations corresponding to the modulations of the sound current.

Through the medium of the diaphragm and horn, or baffle, these vibrations reproduce the original sound. This action can be readily reversed; if a sound falls on the diaphragm causing the diaphragm and coil to vibrate, there will be generated in the coil a small alternating voltage which corresponds to the impinging sound waves. This is the way in which the electro-dynamic transmitter operates and indicates the origin of its name.

The construction of the new transmitter is very similar to that of the 555-W receiver, except that instead of an electro-magnet a permanent magnet of cobalt steel is used. There is, of course, no horn or baffle. The diaphragm is of thin duralumin. The coil is of edge-worn aluminum ribbon. The diaphragm is protected by means of a disc of perforated sheet metal mounted in front of it and this in turn is covered by a thin piece of black silk.

It is noteworthy that so far as is known this is the first time that the electro-dynamic principle has been used commercially in a transmitter, although in the first years of telephony Alexander Graham Bell employed a closely related principle by using one structure of the ordinary electromagnetic telephone receiver for transmitting.

Sound Being Installed in Chinese Theatres

SEVERAL installations of motion picture sound equipment are in course of erection at present in China. At Harbin, Manchuria, and the Portuguese Colony of Macoa the first theatres to be equipped with sound apparatus are now in process. Other installations are being made at Canton, Amoy and Peiping.

It is estimated that there are at present a total of 50 theatres throughout China equipped with sound apparatus. Of this number, 35 are American equipment. The remaining 10 or 15 installations are reported to be of the French disc type (Pathe-Orient), being utilized by the cheaper Chinese theatres in and about the Shanghai area.

The new King's theatre at Hong Kong was opened recently, making a most favorable addition to the cinema houses in that city.

AC-Operated Equipment Put Out by Masterphone

A NEW and completely alternating current operated equipment, requiring no motor generator, "A" or "B" batteries, battery charger or pre-amplifier, has been announced as now ready for distribution by the Masterphone Sound Corp., of Seattle.

The new Masterphone AC-operated sound reproducing sound equipment, it is said, will entirely eliminate the causes of pre-amplification troubles, distortion, microphonic and rushing noises.

A completely centralized control panel simplifies operation, the company claims.

New Baby Spot Offered by Cinema Equipment Co.

INTRODUCTION of a new baby spot which may be used for headlighting, lighting novelties, statuary, lobby display, spotting an orchestra, etc., has been announced by the Chicago Cinema Equipment Co., manufacturers of projection apparatus, orchestra equipment and stage lighting.

The new spot is of the round type construction, mounted on a rectangular base, 5 inches by 7½ inches, and may be set on any flat object in any position or it may be screwed to the wall. It is fitted with an Edison base receptacle for 250-400 watt Mazda lamp, 4½-inch condenser, and is furnished complete with four metal color frames and color.

Voltage Control Unit

A MANUALLY operated line voltage control unit designed to illuminate fluctuations in the input power to the amplifier, for use on 50/60 cycle circuits and consisting of an adjustable auto, has been placed on the market by the American Transformer Co. of Newark.

Voltage may be maintained, it is said, at 110 or 115 volts and the unit can be used where the existing supply is between 90 and 130 volts. The device, known as the AmerTran Power control, Type T-750, is housed in a sheet metal box designed for wall mounting. Overall depth is 9 inches and requires wall space of 6¼ x 11¼ inches. A 3-inch diameter flush meter and a 2¼-inch knob are used to control the unit.

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Bell & Howell Announce Chicago Building Expansion

THE IMMEDIATE addition of a third story to the Bell & Howell Company's engineering building in Chicago is announced by J. H. McNabb, president of the company. This building was erected only about two years ago but is already outgrown.

The engineering building is devoted exclusively to experimental and development work, and the additional space, totaling 17,000 square feet, will be given over to experimentation on talking picture apparatus. Outstanding features will be a completely equipped sound laboratory and a sound projection studio with stage.

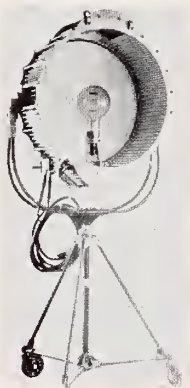
The construction of the new addition will be reinforced concrete flat slab with exterior walls of face brick with stone trim and steel sash, to match the present building. The roof will be insulated. Interior partitions will be mainly of glazed tile. The addition will be 153x112 feet and will be thirteen feet high.

The engineering building is separate and distinct from the company's main offices and factory which are likewise located in Chicago.

Work has been begun on the company's new two-story branch sales, service, and engineering building in Hollywood, and the expansion program of the Bell & Howell Company is surely convincing proof of its confidence in the business future of the country in general and of the motion picture industry in particular.

16 Will Be Made in East

OUT of the 65 or 70 features to be produced by Paramount for the 1931-32 season, 16 will be made at the New York studio. This is the same number scheduled by the plant for the current year.



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Super Sensitive Film and the Still Man

(Continued from page 9)

Another feature of the new film, too, which aids in this improvement in perspective, is the uncanny way in which it seems to reach into the shadows, without burning up the high-lights. This gives us natural shadows, such as our eyes see: shadows which are definitely recognizable as shadows, but which are not on that account mere pools of black. Except in the most unusual cases, our eyes see shadows as areas of lesser luminosity, but still perceive the detail in them; so does the new film.

This makes it vastly easier to work in extreme low-key lightings, particularly for still photographs, as we can get our natural low-key effects without sacrificing either shadow-detail or highlights.

I have found these same qualities to be equally advantageous in portraiture. The speed and color correction are, of course, obviously beneficial; and this same extreme latitude proves an even greater benefit, as it gives a greater degree of roundness, and a snap and sparkle that were heretofore missing, particularly where a moderately soft, flattish lighting was employed.

But pictures speak louder than words, and the accompanying pictures can tell the story much better themselves. The one thing that they cannot tell is the technical facts of their making. Figure 1 was made on the old-type stock, with the set lit for the Super Sensitive film which Mr. Mohr was using. The exposure was 1 second, at F:8. Figure 2 was made from a slightly different angle, but with the same lighting set-up; Super Sensitive cut film was used, and the exposure was 1/5 second at F:8. Figure 3, a portrait of Marion Schilling, was made on the old-type Panchromatic stock; the lighting was from two 1,000 Watt floodlights, with two silks on each, and one 400 Watt back light, with one oiled frost on it; the exposure was 2 seconds at F:8. Figure 4 was made on the new Super Sensitive Panchromatic stock, with the same subject and lighting set-up: the exposure was 1/5 second at F:8. The fifth illustration, that of Mr. Mohr and myself, was made on the new Super Sensitive stock with only one 1,000 Watt light, the lens closed down to F:16, and an exposure of 1/5 second. Both of the pictures on the old type film were forced, both in development of the negative and in printing, in order to get the best possible prints from negatives which were none too good.

No Wudies For Germany

GERMAN producers will have no color nor wide film in their coming season product, according to Dr. H. L. Boehm, the only man to come from Germany to Hollywood for the Convention of the Society of Motion Picture Engineers.

Dr. Boehm, who represents the German Society of Photographic Research, International Educational Film Institute of the League of Nations, and the Association of German Educational Film Producers, says that the German producers have enough troubles, including sound, without adding either color or wide film. He did say that UFA is experimenting with a color process.

New British Sound Firm Enters Production Field

BRITONE SOUND STUDIOS, Ltd., England, a new registered company with a new variable area system of sound recording, has started studio operations under the general management of Kessler Howes. Both features and shorts will be made, with the feature output amounting to about six pictures a year.

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Amateur Movie Making

by WILLIAM STULL, A. S. C.

LAST NIGHT at dinner, the conversation swung to amateur movies. My host—a confirmed professional globe-trotter and amateur cinematographer—turned to me with this remark: "You know, Stull, amateur or not, when it comes to scenes with people in them, either as long-shots or closeups, I'm not the least bit ashamed of the results I get; but when it comes to landscapes—particularly distant ones—I'm an awful duffer. I almost always overexpose them, and, whatever I do, I can't help getting them pretty hazy and flat. What's the matter, anyway?"

Proper Exposure in Landscapes.

It was not the first time that this question had been asked me, for Mr. Blank's trouble is one he shares with many another expert 16mm. worker. The answer is that he has not learned that his eye and his film (even Panchromatic) do not see things the same way. He overexposes his picture because he forgets that, although to his eye a landscape appears to reflect **less** light than a normal close scene, in reality it reflects **far more**, just as a large reflector will reflect a greater quantity of light than a small one will. The safest way to secure correct exposure for such scenes is to use one of the exposure-meters which actually measure the light reflected from the subject (like the Drem "Cinephot" or the Bell & Howell "Photometer")—and to **trust the meter implicitly**. There will be times when the exposure indicated by the meter will seem unbelievably small; when every instinct will cry out that you can't possibly get a decent exposure under such circumstances: that is the time to remember that the scientists responsible for your meter know far more about photography than you do—and to follow their recommendation devoutly. If you don't the overexposed film you will get back from the laboratory should be enough to convince you of the error of your ways!

But not all of us have such meters. Some of us may feel that the ten or fifteen dollars which such things cost can be better spent elsewhere—and quite forget that if the meter were to keep us from ruining only two or three rolls of film per year they would be paying for themselves, with more than sufficient interest to boot. Some of us may feel that we have had enough experience to worry through without the extra bother of using a meter—and forget that although we may be able to estimate the correct exposure for ninety-nine scenes

out of every hundred, that hundredth scene which we go astray on is almost invariably an important, irreplaceable one. And sometimes, those of us who do have meters forget them when we most need them. In cases such as these, the only thing to do is to remember that we cannot trust to either our eyes or our instincts, and that the only thing to do is to reduce the exposure to a point considerably beyond the stop which our instinct tells us will give us an underexposed film.

Cutting Out the Haze.

But, even when landscapes are correctly exposed, we still will frequently find that our picture is hazy and flat. This, again, is due to the fact that our eyes and our films do not see things the same way. To our eyes, the region of greatest brilliancy is in the yellows; to the film, it is usually somewhere among the blues, exactly where depending upon the make of the film, and whether it is Pan or Ortho.

Now, even on days that are quite clear, we often find that our pictures show the distance as shrouded in a sort of hazy mist. This is because the air—except in the desert or at high altitudes, actually contains a considerable quantity of mist, or, to put it scientifically, suspended water-vapor. These suspended particles of water-vapor are practically transparent to the longer waves of light (the yellows, reds, browns, etc., which form the larger proportion of the **visual image**), but they scatter the blues, violets, ultra-violets and, sometimes, the greens—which are the important photographic rays. Therefore, although a distant scene may seem clear and distinct to the eye, it may (and usually does) seem quite misty to the film, which obediently gives us an accurate picture of what it sees. So we must trick the film into seeing the view more nearly as our eyes do. In other words, we must absorb this scattered blue and violet light—and most particularly the invisible ultra-violet light—if we are to get the good, clear picture that we want.

To gain this end we must first of all use a film which is sensitive to the remaining colors of the spectrum, as well as to the blues and violets. Therefore, **Panchromatic film, of course.**

But "Pan" is still sensitive to the blues and violets—and therefore to this blue-violet haze which we are trying to eliminate. So we must in some way absorb this objectionable haze (which is there, whether we can see it or not) before we let

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An excellent example of results obtained by use of a filter. Left, no filter used; right, same scene under same conditions but a Ramstein-Optochromic filter was used.

NOW—A NEW LOW PRICE for the famous **Filmo 70-A**

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*What you see, you get
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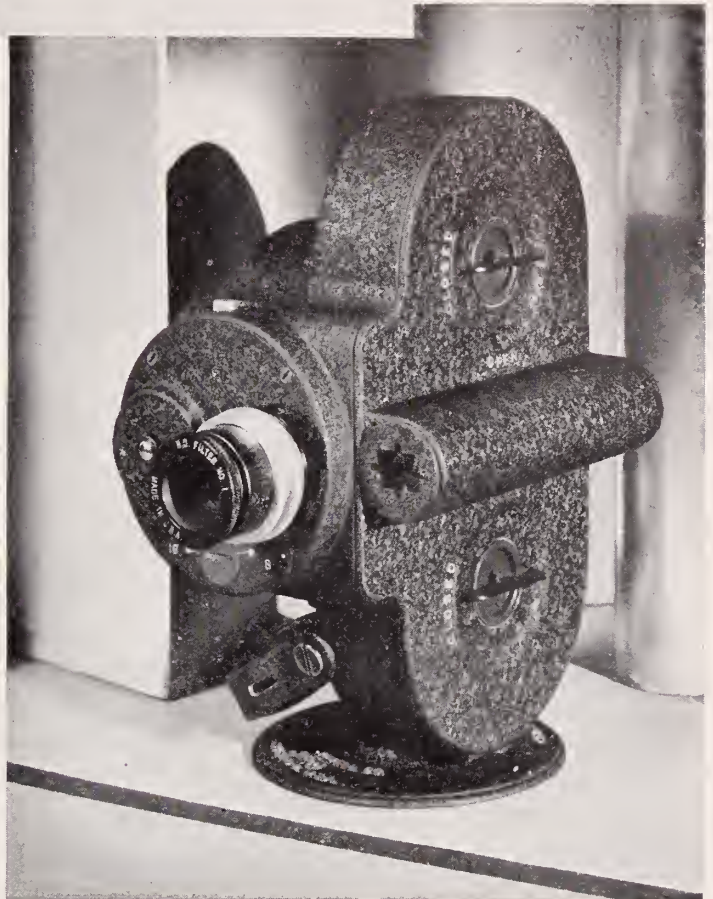
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B E L L & H O W E L L
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F I L M O



Upper left, Paimpol potato market. Upper right, hasty retreat of man from bad bargain. Left center, Guingamp market. Center, a house at Paimpol. Right center, Guingamp street on "Pardon" day. Lower left, Paimpol general market. Lower right, Guingamp cattle market.

Babbling About Brittany

by LAWRENCE GRANT

This is the third article of an unusually interesting series which Mr. Grant has written for this magazine. The next will appear in the July issue—Editor's Note.

I HAD heard much of Paimpol and the Ile de Brehat. Paimpol because it was the place where Pierre Loti's famous tragic story "Le Pecheur d'Islande" was laid; the Ile de Brehat because of its wild North Brittany beauty.

From Paimpol the fishing fleet sets out once a year to the icy seas of Newfoundland, and the shores of Iceland. When they return the famous "Pardon" of the fishermen takes place in gratitude for the safe return of those who have been on either of these very dangerous trips.

The Paimpol people are extraordinarily industrious, for no sooner have they come home from the fishing expeditions and disposed of the fish, than they change their occupation and become ardent agriculturists. Growing potatoes and other vegetables, working hard at this until just before the time comes round again for them to get their ships ready for the next departure to the distant seas.

Thus there is not only a fine fish market and tremendous amount of business done with Paris and London, but there is a potato market in which vast quantities of Paimpol new potatoes are packed and sent off to the same destinations.

But the rain is frequent on this north coast, and while it is good for agriculture, it is bad for photography, and here on market day it was raining all the time. However you have to make your pictures, rain or shine, you cannot make a "location call, weather permitting" there as you can in a picture studio, the markets and "Pardons" go on whatever the weather, and you must "shoot" or lose the picture.

I made friends with a potato dealer here, he had visited some of his London customers one year, and had taken the opportunity to see Aldershot and Chiselhurst, the latter place he told me was "where Mrs. Napoleon lived." It took me some time to realize that he was serious, and that this was his republican way of referring to the late French Empress Eugenie, who was a great friend of Queen Victoria and lived for many years in England after the last Revolution.

I spent a few days at Guingamp before coming to Paimpol trying to hire a cart to drive me around to neighboring places for eight or ten days. I finally settled with a man for horse and "victoria" for 17 francs a day. But the next day the cocher who was employed to drive it, (cochon would be a better word) said the proprietor was not paying him enough out of it, and refused to go, unless I consented to pay twenty francs a day. I said I would not do that, for I found that it was not so much the money that was upsetting him, but the idea of being away from the comforts of the hotel he called his home, and the hag he called his wife. It was an unthinkable hardship, particularly as he would be likely to have a different bed each night with linen, nasty cold clean linen, to sleep in. It made him shudder to think of it, so it was "off."

Then I arranged with a Ford car for 30 francs a day and started off for Paimpol, but when I got back to Guingamp all ready for the trip, the Ford man refused to carry out the bargain. Why? He did not know, but he could not go. Maddening people, at times these French peasants.

Paimpol is situated rather far from the open sea, at the head of an estuary, so if you want a seaside resort for summer vacationing you go down to Kerity, where small houses and cabins can be rented and bathing is good.

After making friends in the market and listening to political talk of the Customs officials, who said that so many relatives of

local politicians had to be taken care of and given Customs jobs, that the money provided for this service was split up into so many portions that no one got enough to make an honest living from his salary, so what could you do but get a little "on the side," I went on to the "Ile de Brehat," a wild, rocky and picturesque place. Do not miss it. The arrival of an "American," for that is what they thought me, was soon noised around the little place from Mairie to market, and from market to the Inn.

I lunched with the local lights, the Mayor and the Rotarians of the Island, and for half a dollar we had:

RESTAURANT GASPARD.

Ile de Brehat.

Dejeuner.

*Homard a la Americain

Rognons aux Truffes

Gigot d'agneau roti.

Pommes de terre. Salade.

Fraises aux Kirche.

Entremets.

Demi tasse.

Vin rouge. Cidre. Vin blanc.

Prix Frcs. 2.50.

*This item in my special honor.

In Brittany we shall see many large monoliths, and clusters of other large stones, called by various names. Here is one the size of which can be computed by the girl who stands guard under it. We will go into this matter in a later talk, but in the meantime, I printed this here because I wish you to notice the resemblance of the Stone to the Church tower—even if to nothing else. They are, in fact, the origin of all towers and spires. Their own origin goes back to the dawn of the world, the beginning of man, and his worship of that which created him.

There is another thing I would like to draw your attention to in Brittany, that is, the importance of Women, and their activity in every field of work. You do not have to take my word for it. Just look at these pictures as we go along together. Look at those which are illustrating this chapter. Women, under the umbrellas in the Paimpol potato market, women in the market where the tents are, women in the market square of Guingamp, women in the street of the Fair at Guingamp, women almost entirely even in the cattle market, and women, five of them, inside the gates of the potato market, and a solitary man leaving with a jaded expression as one who has just been "bested" in a business deal.

So having spent some time in viewing the beauties of the island, but more in convivial lapping up of "le cocktail" vin rouge, benedictine, and cafe cognac with cigars in company of the Mayor and other sober, respectable and important people, I returned to Paimpol, and having given very positive instructions that I must be called at 5 A. M. to catch the 6 o'clock train back to Guingamp, I retired sleepily to bed.

And they called me at 5.45!

Yet nevertheless I was down at the station a few minutes before the train left, and it left on time! How did I do it? I do not know. Everyone got to work on, or for me. Loud shoutings in the inn yard, jingling of harness while the voiture

was being prepared for me. Clattering, chattering, commotion everywhere. Throwing all false prudery aside and all false modesty to the four winds of heaven the young daughter of the Inn, and her still young and lovely mother came into my room and literally dressed and packed me, while another lovely chambermaid brought me the inevitable cafe with crescents, and in ten minutes I found I had been dressed and packed and drunk warm coffee, and said "Good-bye" and was seated with a crescent in each hand and all my luggage and cameras aboard en route for the station.

And all this time I had never noticed anything except three very charming women were intent on getting me ready and that "Honi soit qui mal y pense" was a good motto.

Anyhow there I was at the station at 5.55 and there was the station master. Did I say station master? No. He was everything there was. As usual "pendant la guerre" the station was being run, and run well by one individual! Like the late Will Cressy, that splendid Vaudevillian, in "Town Hall Tonight," when he informed a visiting artist that he was everything from Manager to Call Boy at the local "opry house":—"Whatever there is—I am. Whatever I'm not—there isn't."

Well, our Guingamp station master was old, very old, but he was all there was, and this train starting was going to be done according to Hoyle, or in other words, to the credit of the "Chemins-de-fer de-l'Etat-de-Normandie, Bretagne, et lignes diverses en correspondance" in particular, and of France during war time in general, if it killed him.

First he unlocked the station doors and let us into the booking hall, then he locked the door again. The door leading to the platform being already locked, he had us safely here and could deal with us at leisure, or as much leisure as five minutes to starting time gave him. He went into the booking office and sold us our tickets. Then he snapped down the little window, ran back to the booking hall, weighed our baggage and gave us the checks for it. Then he hurried back to a private door to the platform, and like a quick change artist, appeared at the door, unlocked it, examined and punched the tickets to see that there had been no error committed by the man who had sold them, (himself) then he locked the door again. Forgetting the characters of ticket seller, baggage master, and ticket inspector, he became now the station master. He herded us to the train. For a moment he became the porter and flung our baggage into the baggage car. Back to the station master, he slammed every door along the train shouting the French equivalent to "All aboard for Guingamp and places South," gave a last inspecting look, and then the signal to start! 6 A. M.!!

And the signal to start was by the usual French method. A toot or two on an instrument between a child's toy trumpet and an old fashioned powder horn, a blow on a whistle, as a concession to the twentieth century, and the engine, making more noise than the Century Limited, announced to Paimpol and the waiting world that **the** event was happening, the train was leaving on time, on its perilous journey for that distant and important spot, Guingamp, at the hair raising speed of twelve miles per hour.

However even twelve miles an hour got us back to Guingamp in time for that great "Pardon."

Now we talk frequently of drinking vin rouge and other more "forte" liquids, but aside from being pleasant and exhilarating they are safe, which water in Brittany most decidedly is **not**. To drink it may be fatal. During your visit I cannot too strongly urge you to listen to Julian Eltinge's advice occurring in one of his songs: "Don't go **near** the water daughter." It carries typhoid risks in every sip for strangers, or it **may** do so, for the wells in the smaller places are frequently in amazing proximity to the farm yard and the drain (if any), or the drain is near the river and the river flows just behind the kitchen, and so—

Yet local people can drink and be immune, though I have seen a modern separator separating cream from milk, pigs

food being prepared, and a large wooden bucket full of manure, all in the same cottage room, and the wooden bucket had every evidence of being used at other times for flour. Yet their caps, their faces, their linen and their cottages are spotless.

I remember after doing two hours work in a farm yard with my cinema camera, the farmer's wife asked me if I would have some refreshment. I said I would take a bowl of cider. She brought it, in a big bowl. I started to drink. Immediately all the baby pigs I had been photographing came squeaking and jostling round me. I asked Why? She did not know, unless perhaps it was because she usually brought them out their food in the bowl I was drinking from!

Nevertheless everything is picturesque, even if to be so, makes it sometimes impracticable, and sometimes not so sanitary. For instance Guingamp. Famous for its Market day, its church of "Notre Dame de Bons Secours" with its great Virgin dressed in costly robes, which is carried round the town at the great Feast of Notre Dame. (Note that **every** little place in Brittany is famous, even if it is famous for not being known at all by casual visitors, and there are some we will visit that are famous just for that). Well, in Guingamp on Market day the Narrow Rue Notre Dame is practically closed to all but pedestrian traffic, with boutiques, (market stalls) blocking the side walks, and in the great square a mass of jabbering, bargaining, jollying crowd of farmers, their wives, and their hens and their calves and their pigs, and their "truck garden" produce, and their butter—and please do not ask me to describe Brittany butter—it must be eaten to be believed—delicious!

Under the trees round the corner another lot of women haggling over milch cows and calves with proddings and appraisals and accusations of extortionate prices they are asking compared to those they got at St. Briec last week, and what bad weather for the crops. "Very unusual for the time of year" (and I wonder **where** have I heard **that** before), and how fodder is running low, and hog feed running high, and daughter is going to marry a man from St. Malo, a **Frenchman** and a city man, so probably no good, and "Voulez vous prendre quelquechose a boire?" And the reply: "**Now** you're talking" or breton words to that effect, and into the estaminet they go. When will they come—or be dragged—out?

It is a never to be forgotten scene, the procession of the Pardon of Notre Dame de Bons Secours, for it is a Marche aux Flambeaux at night. Bonfires in the square—torches carried by everyone—relics under golden canopies—carried shoulder high by stalwart costumed peasants, or lovely girls in pure white—Sacred banners—the Great Virgin in robes rivalling a Queen's at a coronation—and the choir—and the crowd and the priests in gorgeous copes—preceded by thurifers swinging great smoking censers. And singing—by a chorus perhaps ten thousand strong.

And then a carousal into the early hours of dawn.

A great night.

And no questions asked. A great day, and comes but once a year and Youth must be served, and you can dabble in a holy fountain on the road home and purify the hand, perhaps, that has offended, and tell your beads in the cart as you jog along, and all is forgiven, but such a night can never be forgotten.

They have another Virgin there, called the Black Virgin, and she used to be the one that was carried in procession, but observing that it always rained when she came out, they now leave her in her place in the Church and carry the pale one. The black one is not really black, for if you examine her you will find her quite pink in the corners of her eyes and wrinkles of her nose. The black is only the dust of ages, I think.

(Continued on page 39)



Upper left, City Hall. Upper right, typical, narrow, picturesque road. Left center, church tower. Center, St. Herve. Right center, one of the countless Menhirs of Brittany (N. D. Photo). Lower left, breakwater of rocky coast, Isle de Brehat. Lower right, cattle market and Pardon; Menez Bre.

Amateur Movie Making

(Continued from page 30)

the rest of the picture record itself on the film. To do this, we interpose light filters—bits of colored glass or gelatine—between the subject and the film. Photographic light filters are made in a variety of colors, but the ones which we want are those particular yellow ones which will absorb the ultra-violet rays entirely, and much of the violet and blue ones, as well. There are quite a few filters of different manufacture which will do this; but the standard ones are the Wratten "K" series, which come in several shades, and are known as the K-1; the K-1½; the K-2; and K-3. As they remove the powerful blue and violet rays, without supplying anything to take their places, they naturally increase the exposure needed, so that the less powerful rays which remain can do their work. They have been scientifically measured, however, and the exact exposure increase for each filter is known. For the sake of convenience, this is called the "filter (or multiplying) Factor". For the K-1, this factor is 1½, which means that the normal exposure (as given by your meter) must be multiplied by 1½. For the K-1½, the factor is 2; for the K-2, it is 3; and for the K-3, it is 4½. The exact filter to use depends, naturally, upon the degree of haze present, and the nature and distance of the scene. For most distant landscapes, the K-2 and K-3 are the best, the latter especially. For closer scenes, and for more distant ones on exceptionally clear days, the lighter filters are more suitable.

On the other hand, for extreme telephoto work—that is, with lenses of six inch focal length or over—the best landscapes are secured with an even deeper and sharper filter. Telephoto shots are usually characterized by an exaggerated flatness at any time, and for distant landscapes a very sharp-cutting filter will help to correct this. Therefore for such use the Wratten "G" filter is by far the best. It is of deeper, more orange hue than the K-3, but its multiplying factor is much the same, varying from 4½ to 5. In use with reversal film, where a slight underexposure is far preferable to a slight over-exposure, the factor had best be taken as 5. Of course, too, with telephoto lenses (or with any fast cine lens, for that matter) it is important that a good, deep lens hood be used at all time, to shield the lens, not only from direct sunlight, but from all light that is not actually being used to make the picture. Most cine lenses come equipped with fairly adequate lens-hoods, but you can hardly go wrong by making an additional hood for your telephoto and speed lenses.

In the Mountains

Mountain work presents some peculiar problems of its own. As you ascend to higher altitudes, the air becomes steadily clearer, requiring less and less exposure. A good rule to follow is to give normal exposures below the 4,000 foot level; from there to around 5,000 feet, ¾ normal; above 5,000 feet, ½ normal, and so on. Besides this, the clearer atmosphere requires lighter filters, if the proper balance between sky, trees, rocks, and snow is to be maintained. For most mountain landscapes a K-1 or K-1½ will usually be satisfactory, though if there is much color in the foreground, a K-2 is often advisable. For telephoto work in the mountains, the K-2 is also all that is necessary, as the "G" filter otherwise used is too strong, unless there is a bit of haze or fog in the distances.

That Bald-headed Sky

Another thing that all too frequently detracts from amateur landscape cinematography is the nakedness of the skies. The professional has long since learned that, where landscapes are concerned, clouds make the picture; accordingly, he avoids, whenever possible, photographing a landscape if an unclouded sky is to figure in it. And if professional film companies are willing to delay production until they can get some beautiful clouds to float across the tops of their landscape shots, the amateur, who is not shackled to an overhead expense of

many hundreds or thousands of dollars per day, can certainly do likewise. A few pretty clouds can make a real picture out of an otherwise ordinary landscape, while a "bald-headed" sky can ruin the best view.

Clouds, of course, being in the intense blue field of the sky, naturally require filtering if they are to be photographed to the best advantage. The exact filter to use is obviously dependent upon the atmospheric conditions and the type of clouds, as well, of course, as the relation of the clouds to the sun. In general, it is probably best to use a good, heavy filter, like a K-3, although this will sometimes make the sky seem darker than is strictly pleasing. There are also times when it is wise to use a graduated filter, which ranges from a deep yellow at the top, to clear glass at the bottom, thereby equalizing between the sky and foreground. But, whatever filters you use, don't neglect your skies, if you want to get the best landscapes possible! It may often mean waiting a few hours or even days, but it also means the difference between a scene that you will be proud of and one which will remain either a lasting disgrace, or an encumbrance on your cutting-room floor.

Screen of Metal Mesh Placed On the Market

AFTER several demonstrations with good results, a new type of metal mesh projection screen, under the trade name of "Lustro-Pearl" and designed especially for high grade theatres, has been placed on the market by the Mandalian Manufacturing Co., North Attleboro, Mass.

The advanced features claimed for this new screen include: A surface treated with the purest of known chemicals, entirely free from gloss, eliminating all distortion common to ordinary types.

Highest reflection factor known to reputable light testing laboratories, effecting a considerable saving of electric current.

Constructed so as to distribute sound very clearly and uniformly throughout the entire theatre.

Can be washed with hot water and soft brush without injury to its surface.

Affords a clear view of any picture from any angle of observation, eliminating eye strain or discomfort to patrons.

Surface may be sprayed periodically for many years, and for this purpose, the company plans to loan for a period of ten years a complete up-to-date spraying outfit with each screen purchased, and furnish chemical solutions from time to time for resurfacing this type screen.

Its high reflective qualities bring out objects in a manner which might be termed the nearest approach to three dimensional pictures, the company claims.

R-K-O Proctor's 58th Street, New York, is among the first houses to install this new type screen.

Foreign Sales Increase

PRELIMINARY figures compiled by the motion picture division of the Bureau of Foreign and Domestic Commerce reveal the fact that approximately \$5,000,000.00 worth of American made motion picture equipment was sold abroad during the year 1930. This is an increase of \$4,000,000.00 over the foreign sales for 1929, and gives a fair idea of the tremendous sales possibilities for our equipment there are in foreign fields. Among the outstanding items were the following: 2,160 35 mm. projectors, 946 35 mm. cameras, 1,667 cameras of less than 35 mm., and 1,634 16 mm. projectors.

Two R-K-O Features in Color

R-K-O will make both "The Bird of Paradise" and "Condoning Wives" entirely by the recently improved Technicolor process, it is announced. Paramount also is to make "Rose of the Rancho" under the process.

"What Projection Lamp Should I Use?"

A discussion of the characteristics of the different types of Projection Lamps available for 16 mm. projectors.

by **R. FAWN MITCHELL**

Technical Service—Bell & Howell Co.

(NOTE:—As representative of a Company selling projectors equipped with different lamps, this article is offered in an endeavor to present the facts concerning the merits and otherwise of the different lamps in a strictly impartial manner.—R. F. M.)

THE AVERAGE amateur movie maker has available to him quite a large selection of projection lamps. From this selection, he has to choose one or rather a projector using one (or possibly two) of these lamps with which to project his pictures.

Naturally, the choice of the lamp or lamps used depends on the work being done. If long throws of brilliant quality are needed, then the most powerful projector available is obviously indicated. When the projector is only going to be used in the home to show a picture three feet by four feet at the most, then the more powerful projector is not necessary.

On the other hand, if the movie maker concerned is a Kodacolor fan, the more powerful light is desirable on account of the great absorption of light by the filters of the Kodacolor lens.

Between these extremes, there is a "middle ground," as it were, where the choice is not so definitely indicated. In any case, an analysis of the theoretical as well as of the practical characteristics involved, should be of great interest.

In a projection optical system, one of the chief requirements is that the projection lens be uniformly filled with light emanating from a light source (the lamp filament). To accomplish this the condensers must be so designed that an image of the filament is produced within the projection lens. This image must be of sufficient size to fill the lens. (The image of the filament is focused actually at the nodal plane of admission of the projection lens.)

In carbon arc lamps we deal with a small spot of light, the image of which, in order to fill the projection lens, must be magnified a great number of times. However, since the intensity of an arc is very high, a very bright image is produced within the projection lens in spite of the magnification.

With the Tungsten filament, the case is different. Tungsten cannot be brought to as high a degree of incandescence as a carbon arc. Consequently Tungsten filament produces a light source which is nowhere near equal in intensity to the arc and therefore does not permit of the same enlargement of the image at the projection lens. To make up for this deficiency, a filament must be made larger in area in order that it will not be necessary to enlarge its image excessively. In other words, the larger the source of a given intensity, the greater the light intensity within the lens.

The accompanying sketches give a comparison of the factors involved in using a 20 volt, 250 watt lamp and the 375 watt, 75 volt lamp. Figure 1 illustrates the using of a 20 volt lamp, which has but two filaments. It will be seen that the image of these two filaments will have to be enlarged many times in order to fill the lens with light.

Figure 2 illustrates the condition existing when a 75 volt lamp is used. This lamp has six filaments so that they do not have to be magnified anywhere near as much in order to fill the lens. It is obvious from this that the six filament lamp should concentrate far more light than the 20 volt lamp. Of course the 20 volt 250 watt filament, because it is designed to carry 12.5 amperes of current as against the 5 amperes carried by the 50 volt 250 watt and the 75 volt 375 watt filament, is considerably heavier and can be operated at a higher temperature; consequently it produces a slightly whiter light than the 50 volt 250 watt and the 75 volt 375 watt filaments. However, even allowing for this difference, it is easy to see that the 375 watt lamp still concentrates more light in the projection lens than the 20 volt.

Because of this color difference, in making visual comparisons it appears that the light of the 20 volt, 250 watt lamp is more intense than that of the 50 volt, 250 watt. Actually the light flux of the former is equal to that of the latter when measured with a photo-cell foot candle meter. The same meter shows that the 75 volt, 375 watt lamp produces 41 percent greater light intensity than either the 20 volt, 250 watt or the 50 volt, 250 watt lamp.

Following is an accurate comparison of the various types of lamps, from which the foregoing percentages have been obtained.

Voltage	Wattage	Lamp	Foot Candles
75	375	Lamp	190
50	250	"	135
20	250	"	135
50	200	"	115
30	165	"	100

An optical bench was set up in such a manner that the lamp position was fixed. The lamp was aligned so that it was focused on a screen 4¾" high and broad in proportion (about 6"). The arrangement was such that lamps could be inserted in the receptacle so that they would be exactly in the same position and aligned so that the filaments were correctly centered. The same lens and condenser set-up was used with all lamps and the voltage was set each time with a

(Continued on page 40)

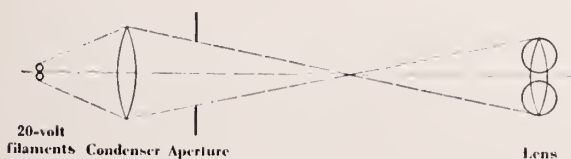


Figure 1

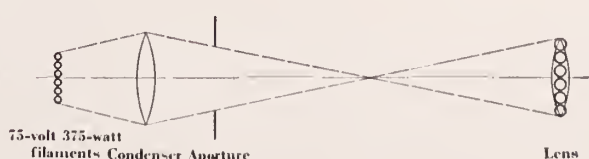
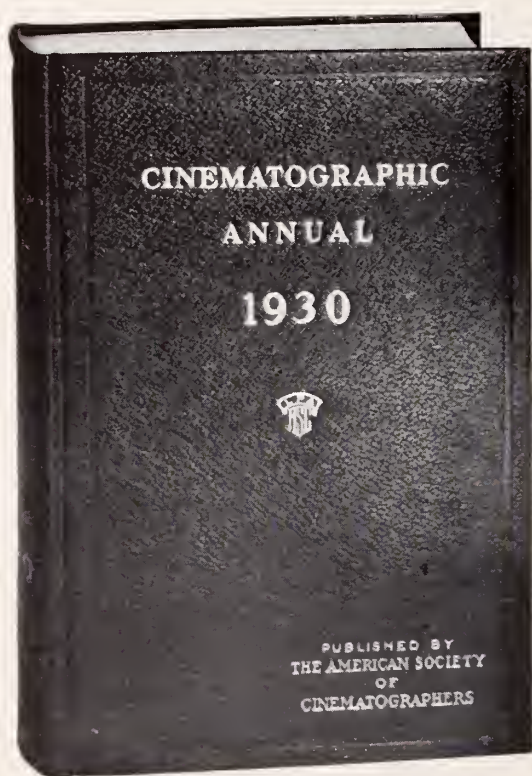


Figure 2

The Last Word for Professionals or Amateurs..*the* CINEMATOGRAPHIC ANNUAL



Compiled and Published by

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Cinematographers**

Hollywood, California

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Babbling About Brittany:

(Continued from page 33)

About 20,000 people flock into the town for this occasion. It is a great sight. Bonnets, and bonnets, and bonnets from every district within reach. A sight worth going far to see and hear.

I should never have gone to Menez Bre had it not been for my potato merchant friend, probably should never have heard of it, for it is a bare hill, and a tiny chapel, that is all.

But they have a great and powerful Saint on this hill, and once a year they combine his feast with a great cattle market. My friend said he was going to the cattle market, so I went with him. I feel sure I was the only stranger that had attended this Fair and Festival for many years.

We left the train at Belle Ile Begard, and then we had to walk up hill to the very top. Once there we found this bit of a church, dedicated to St. Herve, but "you must never judge the power of a Saint by the size of his shrine" and this one is simply all powerful.

This hill top was a great Druid gathering place before Christianity came, and is haunted by two poets, Guenc'hlan, a Druid, and St. Herve, a Christian, and they have a lovely place to fight it out, for on a moonlight night it is too perfect. It is the actual top of the hill, and the view is uninterrupted for the complete circle. You can turn slowly round and see for miles in every direction.

Herve was the son of a Christian poet, and a Druid Poetess, he is excellent for eye trouble and all headaches.

I do not know whether they still do it, but the principal services here was held by the Priest alone at midnight once a year for all the souls who had died during that year without the last offices of the church. He summons all the devils who have them in charge, bids them release any poor spirit they may be holding, gives each devil a grain of corn, and bids them begone. Gruesome task. Alone at midnight on the top of a spooky hill, counting out grains of corn to devils.

They have a very pleasant euphemism for pigs hereabouts. They call them "Chevaliers de Rohan." This man actually lived and was known everywhere for vile manners, especially at table.

I could not find out why the farmers should drive all their cattle up this hill at Menez Bre to bargain and haggle, and buy and sell, and bring up all the tents and the food, and the drink, when all this could be done far better at Belle Ile Begard where there is a station. It is true that they keep the feast of St. Herve at the same time, making a yearly market day for the cattle, and a gay festival for the Saint, but they could do that down at Begard if they wished. There must be some terrific force in religious tradition that brings them all up that hill to that tiny church, for it is not a great cathedral where a wonderful ceremony is held, but a wee place where only very few people can get in at a time.

But there is kept the relic of this saint, and up that hill you must go that day if you wish to obtain his benefits or make a good cattle bargain.

There is no floor to this chapel, only the hard earth, but it has quite a solid tower, and in the tower a nice little private room, or rooms, and after conducting a few masses during the morning, the jolly little cure, to whom I had been presented by my potato merchant friend, who seemed to know and be known by everyone everywhere, guided this merchant, another choice companion, a gendarme and me up to this upper chamber, where we found a marvelous lunch had been prepared for us by a comely peasant woman, the Cure's housekeeper, for even a celibate priest must have a woman around to look after his material needs in his house.

That has always seemed to me one of the difficulties and problems of celibacy, you cannot have a wife, yet you have

to have a housekeeper. I do not see how even St. Anthony could stand that sort of temptation for ever day after day, and still keep his reputation.

However if you pay a prolonged visit to Brittany you learn a lot about the Catholic religion. Its rigidity and its elasticity; its obvious wisdom and its apparent follies; but above all its deep understanding of human nature and human needs, and while you may still be a heretic when you leave, you will have a vast respect for something which has survived for centuries, held the imagination of the people, and brings such hope and comfort as these peasants get from their very human friends, the local Priests.

Father O'Flynn, the famous Irish Priest of the long ago is duplicated in almost every village, and though I do not think I quote quite correctly, as I met these men I was always thinking of the chorus of that old song:

"Father O'Flynn, ye've a wonderful way wi' ye,
All the young children are anxious to play wi' ye,
All the old women are waitin' to pray wi' ye;
Father O'Flynn, ve're a **wonderful** man."

H. T. Cowling, A. S. C.



ONE of the busiest men attending the S. M. P. E. convention in Hollywood last month was Herford T. Cowling, treasurer of the S. M. P. E., member of the American Society of Cinematographers, and a member of the Board of Editors of this journal.

It was Mr. Cowling's first visit to Hollywood in three years, and in the few days he was here he tried to shake hands with every one of his old friends, as well as confer with the editor of the Cinematographer, assist in the business of the convention, and sign the necessary checks that a treasurer has to sign.

Mr. Cowling is an executive in the Eastman Educational Films, Inc. For many years he was one of the picture industry's most famous globe trotters, having made pictures in practically every country in the world. As he was leaving he declared that he was really glad to start back to Rochester, for the lure of California was fast getting into his blood and he was afraid if he stayed much longer he would want to become an adopted son again.



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Filmo Topics

BELL & HOWELL'S interesting monthly magazine, *Filmo Topics*, contains much of value to the amateur in the June issue. This magazine may be secured free by writing Bell & Howell at 1801 Larchmont Avenue, Chicago, Ill. The contents for June follow:

Movie Treasure Hunts: Have a definite object picture on your vacation this year.

Backward Boys. A 16 mm. comedy made entirely in reverse action.

The A, B, C of Filmo Camera Lenses. Lens markings explained for the beginner.

Suggestions to Kodacolor Users. Getting the best results in the natural color films you take this summer.

Titling Your Films. No. 9. Moving Picture Backgrounds.

X-Ray Your Golf Stroke. About the movie method of learning golf.

The Filmo Projector's Cooling System. Explaining how air helps project pictures.

What Projection Lamp to Use

(Continued from page 37)

carefully calibrated Voltmeter and the illumination measured with the same Standard Photo-Electric Cell. The figures given are relative only, and give the proportion of the light emission between the various lamps. The actual foot candle rating on the screen will vary with each individual situation, but the proportions will be the same. In other words, this test represents the actual measurement of the comparative illumination of the lamps under test conditions as measured by the type of Photometer accepted and used by illuminating engineers.

This test, conducted under such rigid conditions, obviates and discounts tests made in the field, where slight variations in voltage or other conditions introduces variant factors that are not always recognized at first sight.

Note also, that a visual test is confusing because of the slight color difference. When projecting the 20 volt 250 watt lamp alongside of the 75 volt 375 watt lamp, the former will appear gray in comparison with the latter.

Regarding current consumption, the following can be said. Disregarding transformer losses, the 20 volt lamp consumes 250 watts of current. The 50 volt 250 watt lamp operated on 110 volts in series with a resistance, requires 550 watts of current, 300 watts of which is dissipated through the resistance.

The 75 volt 375 watt lamp also consumes 550 watts at 110 volts; however, only 175 watts are dissipated through the resistance. The foregoing indicates that the 50 volt and 75 volt lamps consume approximately twice the current required by the 20 volt lamp. This, however, is offset by the advantage of being able to operate both the 50 and 75 volt lamps either on direct or alternating current. To arrange a 20 volt 250 watt lamp so that it could be operated on both alternating and direct current, the transformer would have to be replaced with a series rheostat which would have to be impractically large size. Under this arrangement the lamp would require 1375 watts of current at 110 volts.

Tests have also been conducted to determine the lamp life of the 375 watt lamps. Six stock projectors were set running, with the lamps adjusted to exactly 75 volts, to give the same conditions as in actual use. The projectors were started and stopped at frequent intervals to still further reproduce the conditions met with in ordinary practice.

Several sets of tests, conducted in this manner, showed the average life of the 375 watt lamp as 48½ hours—(projection hours, note!). This is equivalent to six months to two years' use from the average owner. Several lamps lasted 60 and 70 hours—inasmuch as the 250 watt lamps are only rated 50 lamp hours by the manufacturer, the new lamp gives a very good account of itself.

The main objection to the new lamp is that it generates more heat than other lamps, so a very efficient cooling system is necessary. For the same reason, it is advisable not to run the projector slower than 16 pictures per second when using this lamp.

For long throws, the greatest illumination is needed and the same applies to Kodacolor projection.

Reference to Figures 1 and 2 will show why the 375 watt lamp is better for Kodacolor, from another viewpoint. Kodacolor necessitates the illumination being very carefully equalized over the entire area of the filter. For this reason, the 20 volt 250 watt lamp is less suitable for Kodacolor, than the 50 volt 250 watt lamp—even though they both give the same amount of light. Due to the greater number of filaments in the 375 watt lamp, the light concentrated on the Kodacolor filter is better than that obtainable with the 50 watt lamp. This, in addition to the extra illumination, makes it ideal for that purpose.

It is hoped that this analysis of the characteristics of the different projection lamps available, will be found helpful.

Fore!



Joe Novak with Filmo uses camera to make slow motion pictures of his golf pupil for instruction purposes.

New Correctoscope

EVERY Cinematographer knows how important it is that the distance be correctly set on the camera lens; also the importance of proper exposure.

Hugo Meyer have announced their new Correctoscope, a precision optical instrument for determining the distance of your subject from the camera and for obtaining the correct exposure stop.

Since these two settings for your camera lens are so important in cinematography, it is obvious that this new Correctoscope will be a most necessary accessory for the Cinematographer. It eliminates guess work and is very easy to use. It puts focusing and exposure under direct control of your eye.

Correctoscope is provided with a specially constructed, very critical, focusing lens, in a focusing mount and with diaphragm control, both calibrated just like your camera lens. The image, which is reflected thru a prism, is viewed by your eye thru a highly corrected magnifying eyepiece, whose focus is adjustable to your particular eye conditions.

You see the image **right-side up**.

To obtain the distance you simply turn the focusing ring of Correctoscope lens until the subject is sharp. The scale on the lens indicates the distance.

To obtain proper exposure you snap into place a special light filter and turn the diaphragm ring down until the details in the darkest part of your picture are eliminated. The scale shows the lens stop required.

This is all there is to it.

People suffering from abnormal vision find the Correctoscope easy to use—as it is not necessary to remove spectacles when looking thru the eyepiece.

The image is very brilliant and sharply defined. Since the lens is very critical, the in or out-of-focus appearance of the image is determined quickly and accurately.

Correctoscope is furnished for Victor, Filmo, or Cine Kodak Cameras, and is slipped on or off the camera instantly; a set screw holds it on the camera when it is being used, and a slight turn of this disengages the instrument so that you can take it off the camera.

Correctoscope is the only instrument of its kind, combining the means for obtaining these two most important factors. There are no tables to read or calculations to make. Everything is done visually.

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Use of Liquid Tonic Protects Film 100%

A FILM tonic known as Yankee Lubric, said to preserve and prevent damage to films 100 per cent, is being marketed by the Yankee Lubric Co. of Louisville, Ky.

Films sprayed with this film tonic on both sides in the exchange and at regular intervals while in use in the theatre, will be kept moist and flexible, it is said, preventing buckling and breaking, protecting the emulsion, easing the strain on sprocket holes and lessening projector head wear.

Yankee Lubric is not a grease and will not streak or spot, the company claims.

GOERZ

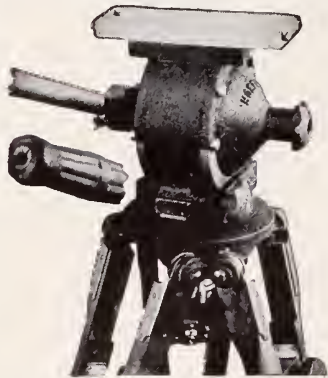
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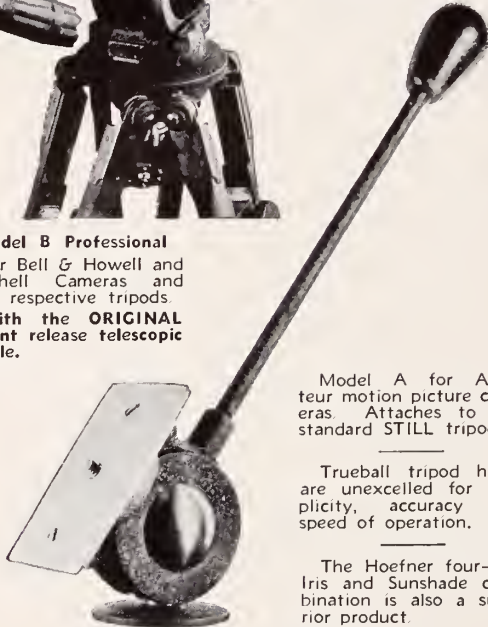
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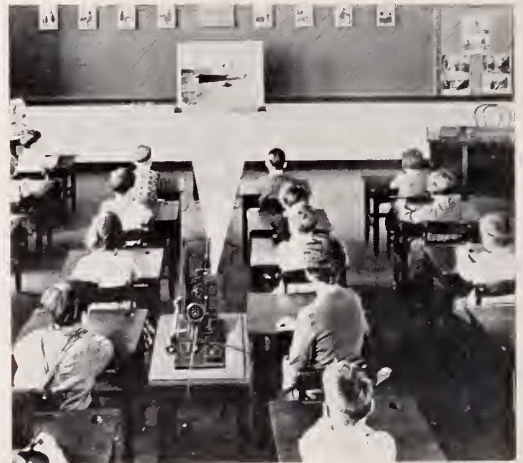
Victor Announces Results of Comparative Tests with 16 M/M Projection Lamps

THE RAPIDLY increasing demand for 16 m/m projectors capable of serving both the auditorium and small room requirements of schools and churches has made LIGHT a factor of major importance in the construction of the better projection equipment.

The lamp manufacturers have accomplished remarkable things in developing lamps to meet this demand. Due, however, to the limitations imposed by the small size of the T-10 bulb and of the optical accessories in the projectors, it appears that their creations in the low voltage, concentrated-filament type of lamp leave little, if any, room for major improvements.

Of these lamps, there are three that are contending for first place as being the best general purpose lamp for the majority of maximum illumination requirements.

These are the 165 Watt-30 Volt MAZDA, the 250 Watt-20 Volt MAZDA, and the 375 Watt-75 Volt which does not carry the Mazda Stamp. That the Watt-Volt specifications on these lamps are somewhat confusing to the average layman is evidenced by the fact that "165 Watt-30 Volts" sounds like a comparatively low rating, whereas the lamp is actually equivalent in power to 605 WATTS in a 110 VOLT lamp.



A Victor Animatophone in use in a classroom. These machines are gaining favor daily in the schools.

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The Victor Animatograph Corporation, Davenport, Iowa, stands alone in offering a projector equipment in which any one or all of these high intensity lamps may be used interchangeably. The Model 3G Victor Cine'-Projector has a built-in transformer to accommodate the 250 Watt-20 Volt Lamp. A change-over system of wiring permits the transformer to be cut out. By plugging-in with the No. 11 Victor lamp rheostat, the 250 Watt-50 Volt, the 165 Watt-30 Volt and the 375 Watt-75 Volt Lamps may all be used in the same projector.

S. G. Rose, Vice President and Sales Manager of the Victor Corporation, says, "It is up to the purchaser to select whichever lamp he wants. We, however, make recommendations and suggestions with the view to enabling the user to get the most satisfactory service possible from his projector."

"Inasmuch as our equipment is not limited to the use of any one of these lamps, but embraces them all, we feel that our findings in the matter can be accepted as being strictly impartial."

Briefly, the experience of the Victor Animatograph Corporation has been this:

The 250 Watt-20 Volt has proved itself a highly satisfactory lamp. When operated at full efficiency, it gives an extremely white and powerful light. It is not unusual to secure a 10 to 12 foot picture with it at 100 feet. The fact that it can be satisfactorily used only with fixed resistance, however, does not permit it to deliver its full volume of illumination on all 100 to 120 volt line currents. Also, the type of resistance that has proved most satisfactory for this lamp limits its use to alternating 50 or 60 cycle current.

The 375 Watt-75 Volt Lamp gives a very creditable performance when new. The Victor tests, however, reveal that loss of efficiency is rapid. Bulb discoloration takes place comparatively early as a result of Tungsten being thrown off and deposited on the glass. The volume of illumination at the beginning is great, but it is not as white and brilliant as that of the 250 Watt-20 Volt or the 165 Watt-30 Volt Lamps. Life of the lamp is also somewhat less than the 50-hour rating given other standard T-10 Projection lamps by the lamp manufacturers.

The results of the Victor tests seem to indicate that the 165 Watt-30 Volt is, generally speaking, the best lamp for all maximum illumination requirements. The filament, in size and shape, appears to be ideal for 16 m/m projection. Constant use does not impair its efficiency. It throws off a very brilliant, bright white light from first to last. Variations in line current do not affect its operation. The rheostat resistance with which it is used is "variable," with the result that the lamp can be operated at maximum efficiency on any 100 to 120-volt alternating or direct current line. For this reason the 165 Watt-30 Volt Lamp frequently excels even the 250 Watt-20 Volt in light volume. A brilliant 12 foot picture was thrown 105 feet with this lamp in a recent test.

It is accordingly apparent from these tests that the prospective purchaser need not worry about the ability of the better 16 m/m projectors to provide sufficient light for all ordinary school and church requirements; for it has been found that schools and churches do not generally have a projection throw in excess of 60 to 70 feet.

36% of German Houses Now Wired for Sound

THIRTY-SIX per cent of the total number of theatres in Germany are now wired for sound. This represents 52 per cent of the aggregate seating capacity.

Total of 715 houses have sound-on-film reproducers. Theatres using disc systems number 1,189. Cinemas wired in Berlin total 210, and those in the provinces number 1,694.

Russia Slates 50 Talkers; To Make Own Reproducers

THE Stalin government plans to produce 50 talking pictures in 1931 for reproduction by means of a nationally made apparatus now being developed by Professors Ramanoff, Tager and Charine.

Already, it is pointed out, there are 112 talking pictures devoted to public health.

National Fire Board Okays Revised Film Safety Code

COMPLETE revision of the standard regulations governing measures for fire prevention in the handling of motion picture film in film exchanges, laboratories, studios and theatres was approved at the 35th annual meeting of the National Fire Protection Ass'n held last week in Toronto, and the report will come before the executive committee next month for final ratification.

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F:1.8
F:2.3

A Non-Intermittent Camera

(Continued from page 21)

The continuous movement has, as well, many advantages to the trick-cameraman, particularly in the making of projected backgrounds, in the making of which camera and projector need not be synchronized as must a conventional camera. Its surprising steadiness at high speeds is also highly advantageous in this type of work.

As has been stated before, this camera can be used interchangeably for black-and-white, bi-pack, and tri-pack color photography. It will take any standard cinematographic lens from 40mm. focal length on; special lenses of an equivalent focus of less than 40mm. are now being prepared by several of the leading domestic and foreign optical firms, so that, ere long, even this slight restriction on the flexibility of the camera will be removed.

And so another impossibility has been made a fact; in the opinion of this writer, Senor Moreno and his associates deserve great praise for the way in which they have attacked this problem, as well as for the surprising degree of success which they have already attained. They have explored a new realm, and, though they have met and will yet meet with technical troubles and difficulties, and find, as all manufacturers do, more than a few unforeseen "bugs" in their creation, they have come the greatest part of the way in making an utter impossibility a proven fact.

Hold Everything!



Even the ball players are making movies. Here is Babe Herman, slugging Brooklyn outfielder, shooting Al Lopez with his Cine-Kodak.

B. & H. Talkies for Home

"HOME talkies are right at hand," states J. H. McNabb, president of the Bell & Howell Company, "and soon all over the country people will be enjoying talking pictures in their own living rooms—an advance which has been attained much earlier than was anticipated by even the most sanguine. "Already our company is offering over 200 16 mm. sound subjects, and it has in sight approximately 25 releases monthly for the next twelve months. Of the sound subjects now listed, practically two-thirds are especially suitable for home use, and the same percentage will undoubtedly obtain in the releases scheduled for the coming year."

A number of well-known producers, including Pathe, Universal, and UFA, have been quick to see the possibilities of the home talkie market, and have made professional subjects available for 16 mm. sound reproduction, it is pointed out by Mr. McNabb.

The Bell & Howell Company, in addition to a fine selection of UFA Educational talkies excellent for home showing, is announcing over 20 Grantland Rice Sportlights, fully as many Aesop's Fables subjects, and such features as "Barnum Was Right," and "The Leatherneck"—all of course, for 16 mm. sound reproduction.

"A number of the progressive photographic retail dealers are already building up comprehensive sound libraries for renting to owners of home reproducers," says Mr. McNabb, "and some dealers have even announced a rental plan by which people who are giving a social function at home can rent both reproducing outfit and subjects at a reasonable fee."

Amateur Club for Frisco

AS WE go to press we receive a note from our good friend George Young of "Camera Craft" magazine, saying that a San Francisco Amateur Motion Picture Club is in the process of formation in that city. The organization meeting was slated for May 26.

An attractive program was outlined for the meeting. It included greetings from W. A. Jones, president of the Greater Oakland Amateur Motion Picture Club; "Incident," a picture made by the Princeton Under-graduate Movie Club; a talk on making movies at the South Pole by Joseph T. Rucker, who with Vander Veer, made that remarkable picture, "With Byrd at the South Pole"; a talk by Sigismund Blumann, brilliant editor of "Camera Craft"; and the organization business. We certainly wish the new club much success.—H. H.

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Volume Control Device

ENTERPRISE Optical Manufacturing Co., Chicago, is said to have developed a new light valve volume control for the Motiograph sound projector equipment. The light control, it is declared, is a means of regulating the sound level by controlling the amount of light falling upon the light sensitive surface of the photoelectric cell, thereby controlling the amount of electrons emitted from the cell.

Cleveland Firm to Make Industrials in Color

TRI-STATE Motion Picture Co., Cleveland, is now equipped to make industrial films in motion, sound and color. The addition of color in making industrials is new, and Jack Flanagan, president of Tri-State, says that its use has stimulated the interest in industrials.

Series of Fishing Shorts Planned by Mack Sennett

"CANNIBALS of the Deep" is the title of a fishing series of six single reel pictures which Mack Sennett will produce for Educational release during the new season. He personally made the shots on fishing trips.

S. M. P. E. Convention

(Continued from page 26)

"Air Conditioning Systems," by A. H. Simonds, Carrier Engineering Corp., Los Angeles, Calif.

"Frequency Control of Photophone Sound Track," by D. J. Tilton, R-K-O Studios, Inc., Culver City, Calif.

"New 35-mm. Portable Sound Equipment," by H. Griffin, International Projector Corp., New York, N. Y.

"The Decibel in the Motion Picture Industry," by V. C. Hall, Eastman Kodak Company, Rochester, N. J.

"Recent Contributions to Light-Valve Technic," by O. O. Ceccarini, Metro-Goldwyn-Mayer Studios, Culver City, Calif.

"New Newsreel Camera," by J. L. Spence, Akeley Camera, Inc., New York, N. Y.

"Storage and Handling of Motion Picture Film," by E. W. Fowler, National Board of Fire Underwriters, New York, N. Y., and L. B. Newell, New York Fire Insurance Rating Organization, New York, N. Y.

"Protecting the Theatre Against the Fire Peril," by R. B. Dickson, Pyrene Manufacturing Company, Newark, N. J.

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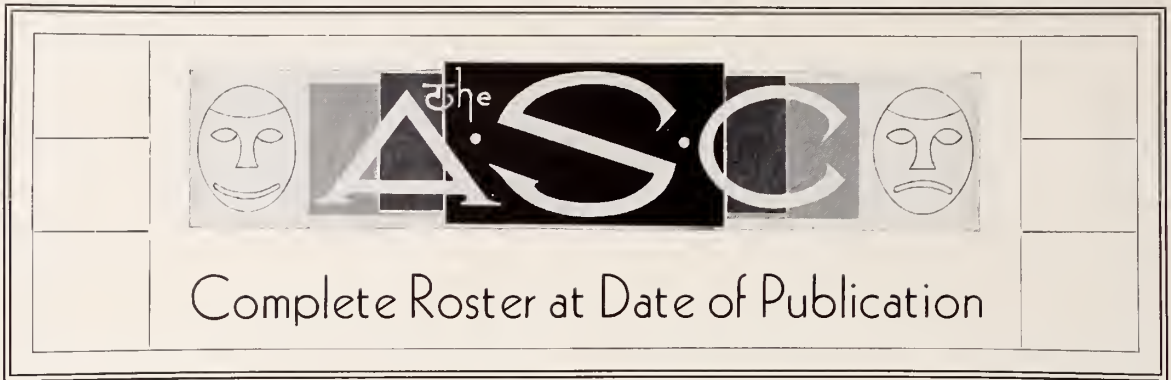
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Screenographs

CAMERAMEN GET FAN LETTERS ON UNUSUAL EFFECTS

By HARRISON CARROLL

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More recognition is given these days to cameramen, but they still are comparatively unsung heroes.

With the development of the amateur movie cameras, the public is taking the initial step towards correcting this injustice. Some of the best known cameramen are receiving as many as 100 fan letters a week, asking technical questions. If an unusual effect appears in a picture, it is the signal for a barrage of inquiries.

These range from the simplest to the most complicated matters of technique. Double-exposures, fade-ins, cloud effects and back-lighting are favorites. Another baffling effect to amateurs is what the industry knows as the "moving dolly shot." Many amateurs walk in towards the photographic subject and cannot understand why their pictures are bumpy. In the studio, of course, evenness is obtained by the camera being bolted to a moving dolly.

John Arnold, president of the American Cinematographers' Society, is a leading figure in the cameramen's battle for recognition. "Why shouldn't we get credit?" he asks. "Who makes it possible for stars to build reputations for beauty and ability. A star can give a rattling good performance, but if she is badly photographed it becomes mediocre in the eyes of the public."

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Los Angeles Evening Herald
May 12, 1931

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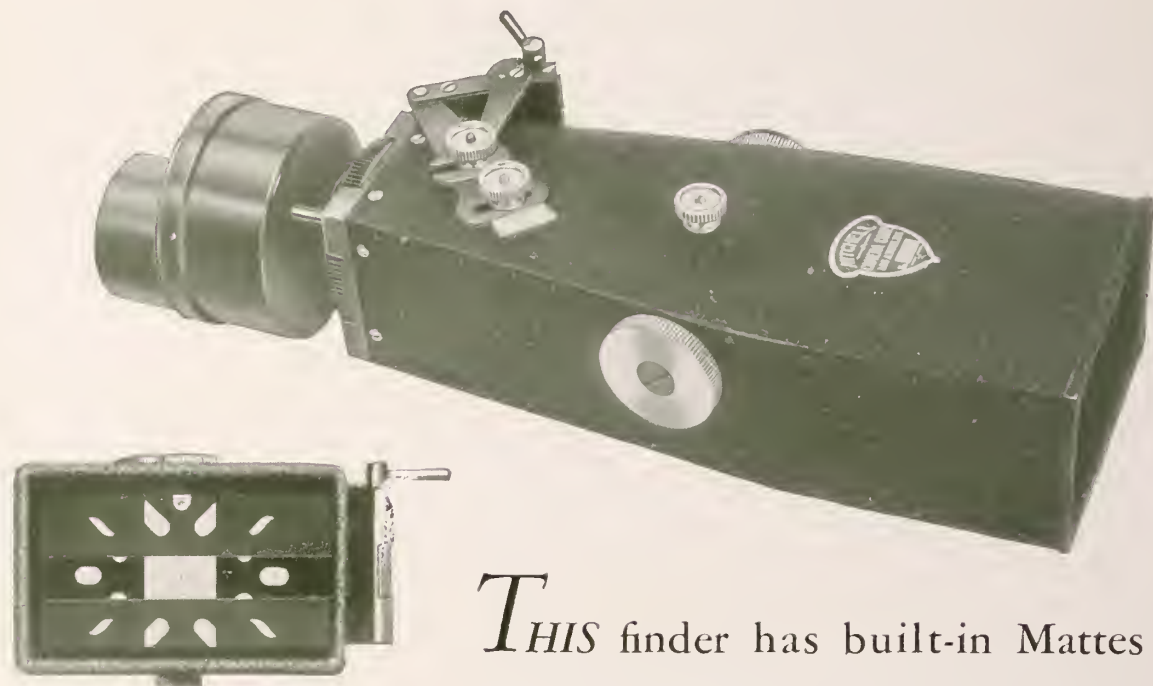
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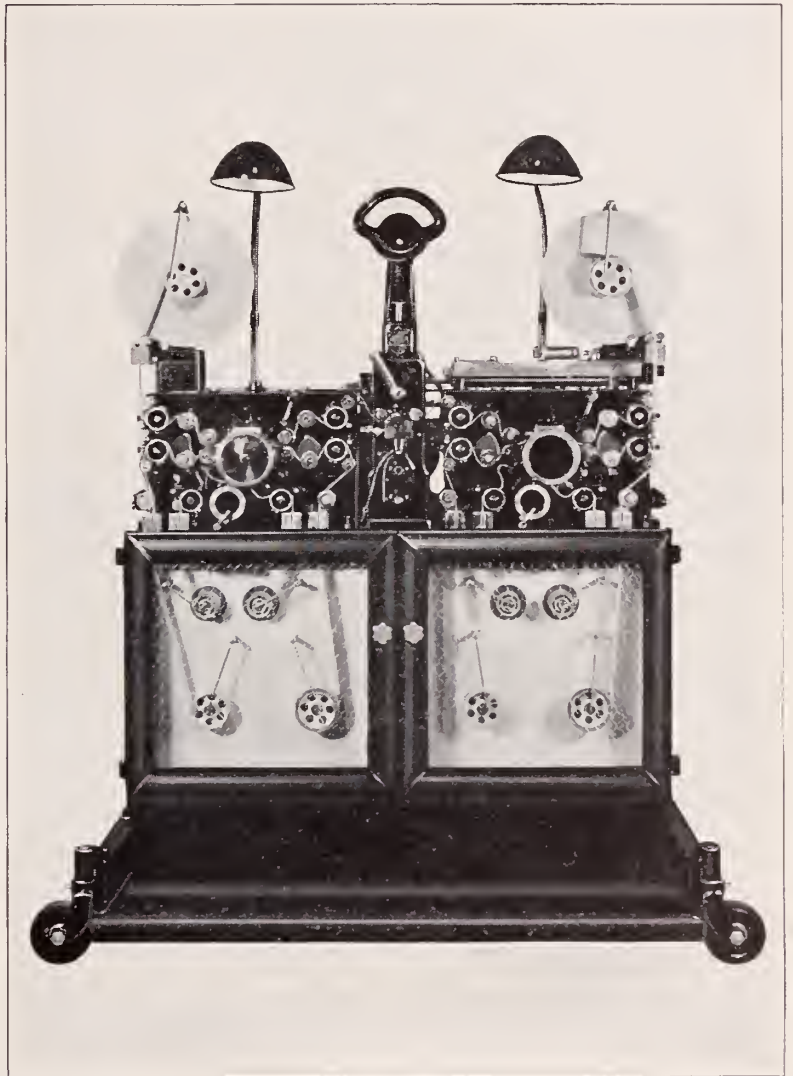
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Volume XII

JULY, 1931

Number 3

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DUE to the increasing popularity of *Laco Lites* and the preference shown for them by a number of our principal motion picture organizations, manufacturers of competitive studio lighting products have made repeated offers to purchase the *Laco Lite* interests of this corporation.

Erroneous statements to the effect that one of such transactions has been consummated and which have gained publicity in the motion picture industry, prompts us to emphatically announce that we do not contemplate such a move.

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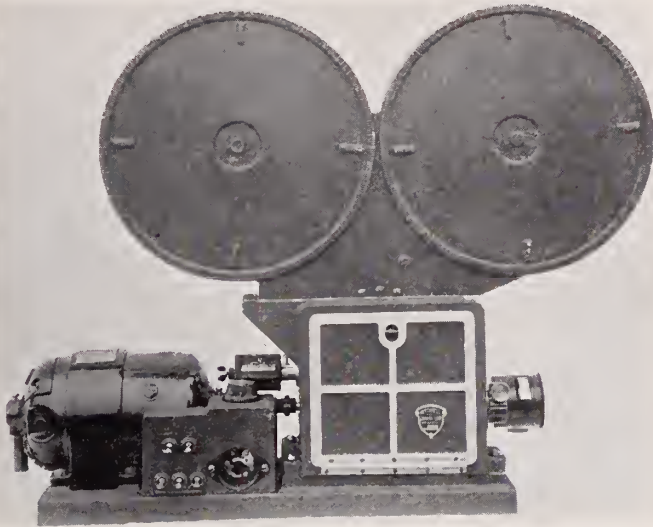
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To the Motion Picture Industry:

The several institutions allied with the motion picture industry who, cognizant of the phenomenal success of LACO LITES, are infringing upon the basic features and principles of LACO lighting equipment, adequately protected by United States and foreign patents issued and shortly to be issued, **are hereby given warning that such action is subject to prosecution.**

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**(Signed) Frank P. Arrousez,
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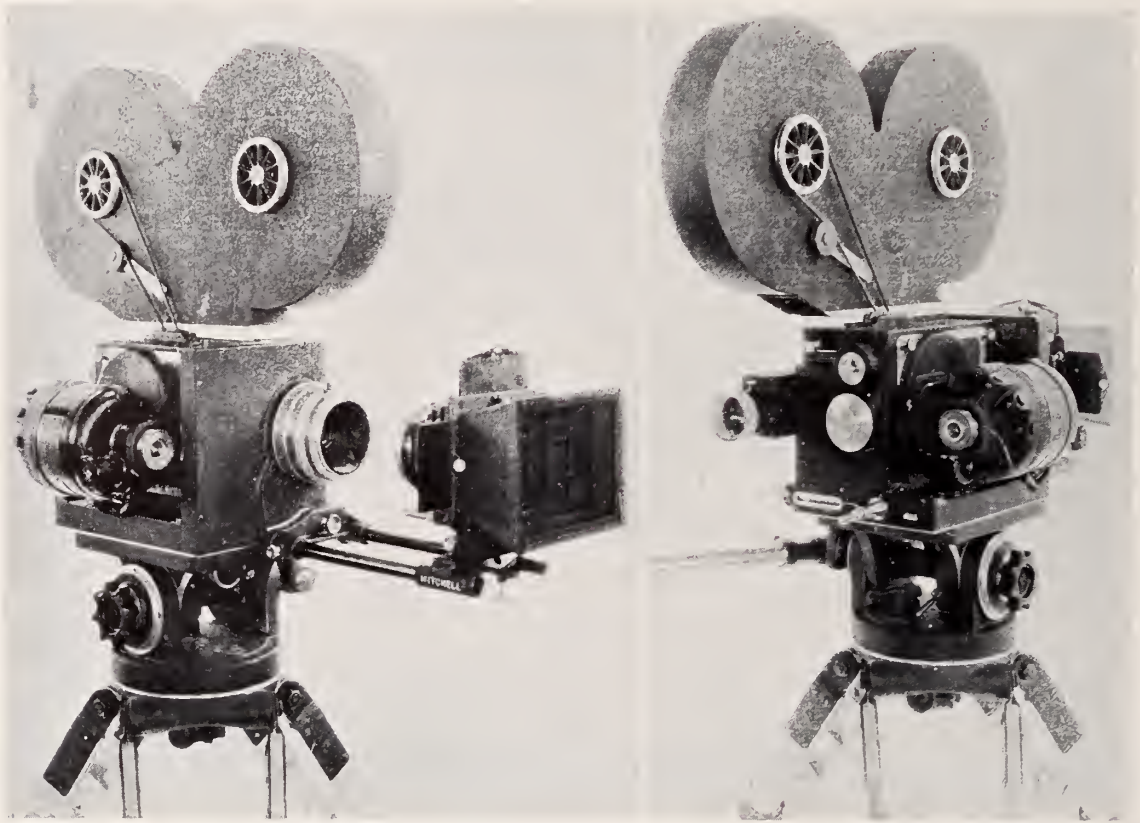
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(Below, Front View of Amplifier)

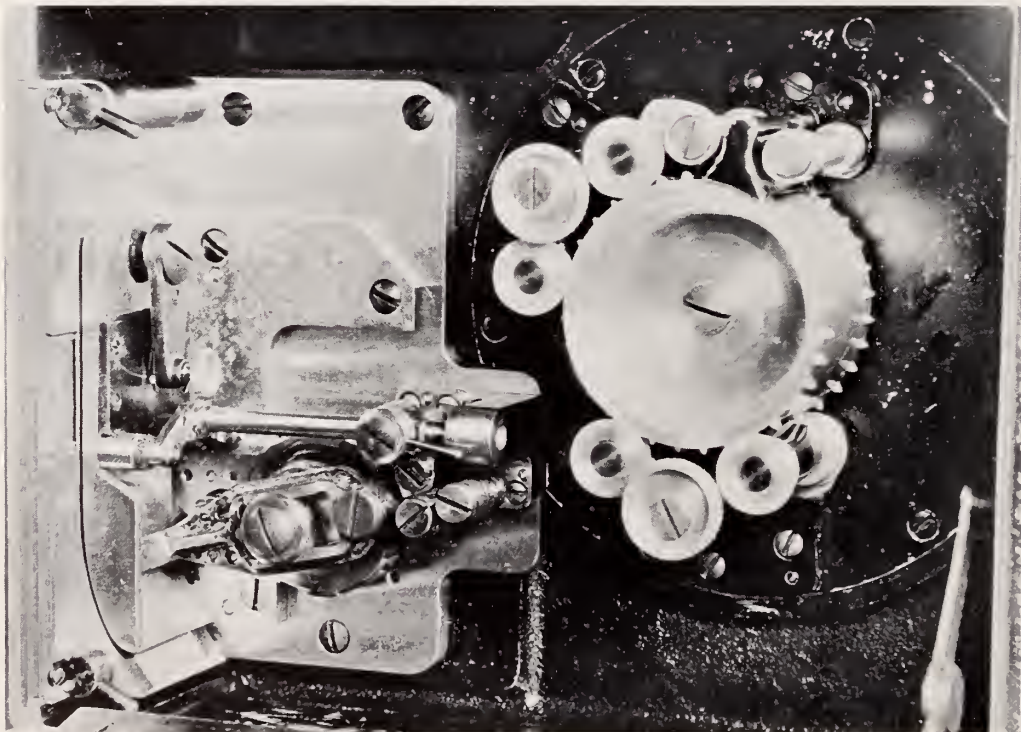


The New Silent Mitchell



Front View

Back View



The Camera Movement

The Silent Mitchell Camera

by WILLIAM STULL, A. S. C.

BEFORE the days of talking pictures, no one gave a thought to the slight noise made by the professional camera. It was merely the well-bred purr of perfectly designed machinery, unimportant save as distinguished from the clatter of cheaply made apparatus. But with the coming of the microphone, this hitherto insignificant hum took on a new aspect: it was a symbol of the fetters with which the new element of sound was binding the highly developed Art of cinematographic story-telling. As such, as well as for more practical considerations, it must be overcome. As long as the cameras were fettered by booths, blimps, and such silencing devices, neither cameraman, director, nor recordist could enjoy either the technical or artistic freedom necessary to the production of perfect pictures.

Logically, the first step toward this goal was the remodeling of existing apparatus to a point where its noise was reduced to the minimum. But this improvement, though considerable, was only a makeshift, and was recognized as such. No amount of alteration could take all the noise out of an inherently noisy mechanism. The best that could be hoped for was a temporary improvement of existing conditions. Real progress must come through a completely new design.

So it is only now, after several years of experimentation and research, that the truly silent cameras are beginning to appear. The first of these was demonstrated at a recent meeting of the American Society of Cinematographers by Mr. George Mitchell, its designer, and his associates of the Mitchell Camera Company.

The new camera is, in outward appearance, not greatly different from its predecessors of the Mitchell line; family resemblances are not confined alone to animate beings. Anyone who is familiar with professional cinema cameras will at once recognize the new camera as a Mitchell. It retains the same general form, and the same general arrangement of its essential units and its accessories. But—it is nevertheless expressly designed for talking picture use. And it is quiet. Not so perfectly noiseless, perhaps, as to be perfect to the jaundiced eye of the most exacting recordist, but indisputably the nearest thing to such perfect silence that has yet appeared.

This silence is secured through two chief factors. First, simplification of the mechanism; and, Second, insulation of the camera box, so that what noise there is does not leave the camera.

The movement is simplified to an almost unbelievable degree. There are but two pairs of gears in the camera! One of these drives the intermittent movement from the main-shaft, and the other drives the shutter-shaft. The movement itself, though of much the same type as the previous Mitchell speed movement, is vastly simplified, and is actuated by eccentrics rather than by gears and cams. The film-moving claws move into and out of the perforations much straighter than before, reducing the strain on the film, and leave the film at rest for a somewhat greater period. The dissolving shutter has been eliminated, as it is no longer needed in studio practice. The angular aperture of the shutter is adjustable from the rear, when the camera is not in operation, and is fitted with a positive lock. Two types of shutter are offered: one in which the opening may be varied from 175 degrees to 0 degrees, and one in which the minimum opening is only 30 degrees, but the maximum is 210 degrees. The shutter is placed far closer to the film than ever before.

The camera case throughout is insulated with a layer of cork placed between the inner and outer walls of the case.

The magazines are similarly insulated, and camera and magazines are likewise insulated from each other, there being no metallic contact between the two. It has been determined also that camera and tripod head be similarly insulated, for, although in the tests made by the company, in nine cases out of ten this was shown to be unnecessary, it is realized that no such series of tests can parallel the conditions of every camera set-up, and, accordingly, insulation of the tripods was adopted as the safest policy for general practice.

The greatest stumbling-block thus far has been the securing of adequately quiet driving-motors. The motors commonly used with the various sound systems, not having been designed for use without silencing devices, such as blimps or blankets, are far from silent. In addition, most of them operate through a reduction gearing. The Mitchell Company, however, have secured special synchronous motors for this use, which are adequately, if not perfectly, silent. These motors, however, necessitate the use of a frequency-changer, as they operate on 48-cycle Alternating Current, instead of 50 cycle. Satisfactory silent motors can, however, easily be developed, and it is to be hoped that the firms leasing the sound equipment used in the major studios will shortly provide more suitable motors, so that the fullest advantage may be taken of this new camera. Until such motors are developed, however, the Mitchell engineers are experimenting with various methods of insulating the present motors, which though a makeshift, should prove adequate until really satisfactory new motors are available.

In addition to their silent operation, the new cameras include several features which alone are of considerable advantage. Most important of these is the new type of lens-mount and focusing mechanism. Under the present conditions, multiple-lens turrets are no longer necessary. Therefore, the camera has no turret: instead the lens is placed in a large, standardized slip-mount, which is capable of accommodating any lens used in modern production. The lens is locked in place by a set-screw, and focusing is done from the rear of the camera by means of a large, milled knob, placed at the lower left-hand corner of the camera-base. **The lens is so mounted that it does not rotate in focusing.** As will be seen in the illustrations, there is a slit at the rear of the camera through which the engraved focusing scale on the driving screw is visible. These scales are removable, and interchangeable. Therefore a separate quill may be had for each lens used, making for absolute accuracy in following-focus with all lenses at all times. A special fitting is made for the matte box, permitting it to be fitted tightly against the fronts of these standard mounts, and excluding all light from this source.

In speaking of his camera, Mr. Mitchell says, "We feel that it is a distinct improvement in many lines, but particularly in the matter of quieter operation. None the less, we do not claim that it is an absolutely noiseless camera. Such cameras will probably come, though they are far from being developments of the immediate future. For the present, however, we feel certain that this new camera of ours will fill a definite place in the industry, for not only is it a very appreciable advance toward the goal of perfectly silent operation, but it is the first camera that has been designed and built specifically for talking picture use, and developed with the benefit of years of intimate, personal experience with the problems of sound-film photography. Therefore, we were very proud to be able to present this camera before the members of the American Society of Cinematographers, whose daily problems and en-

(Continued on Page 22)

Fast Improvements of Fast Film

Some Pertinent Comments from a Practical Cinematographer

by **CHARLES G. CLARKE, A. S. C.**

SINCE the recent introduction of "Fast Film," cameramen of all studios have been making tests and have been photographing regular productions with it. Much has been written and said of its over-all sensitivity, its better color rendition, ease of lighting, less amount of equipment required, and better temperature conditions of the set. In another part of this magazine will be found the endorsement and recommendation of this Society for the general use of this type of film, setting forth reasons for this action. What, then, were some of the problems confronting the cinematographer in adjusting himself to this new medium?

Having recently completed a Fox picture photographed throughout on fast film, I may mention some of the advantages I found that have not been mentioned in papers that have appeared before. The production referred to is "Annabelle's Affairs," featuring Jeanette MacDonald and Victor McLaglen. The breezy, light comedy mood of the picture called for bright, sparkling photography. Its high speed action required that the camera be flexible and mobile to follow the actors wherever they might be, so that intimate bits of business could be put over without the excessive use of close-ups. With this plan of procedure in mind, a balance of light was established which, thanks to the increased sensitivity of the new film, did not greatly exceed that used to illuminate well lighted rooms.

One might presume that if the new film were twice as fast as the old, the amount of lighting units need only be cut in half, and the results would be the same. When this method was tried, however, other serious problems arose quite apart from purely those of light balance. Shadows of the microphone were cast on the walls of the set and were very apparent as the microphone and support were moved to follow the action about the set. "Leaklight" or "Spill-light" was also now troublesome and was caused by the uneven distribution of the few lights used, they being so localized as to make an even balance of light impossible.

The next step was to use enough of the existing lights to give an uniform distribution of light over the sets, then reduce their intensity by diffusing mediums which further spread out the light. This method also remedied the problem of microphone shadows, because the multiplicity of lights had the effect of counteracting the shadows produced by each other. The dominant source of light was placed in such a way that any shadows fell out of the range of the scene. I found the super-sensitive film further advantageous because the volume of light required for exposure was so low that the light fixtures used in the sets appeared in their true relation of brightness, and, in some cases, became the true source of light.

Many of our scenes are photographed from moving vehicles so as to be able to photograph the actors as they move about in close proximity and from the most advantageous angles. The lighting of these scenes is always a difficult problem, particularly because the lights are a great distance away, and not always can they be placed at the best positions for beautiful lighting of the stars. The ever dangling microphone just over their heads further complicates matters, so that heretofore large, bulky lamps had to be carried with the camera to off-set the uncomplimentary shadows caused by the overhead lamps. The new film has made the use of smaller lamps possible, and this greatly facilitates the technic of lighting.

The color sensitivity of the new film has been improved so as to render colors more nearly in the values as seen by the eye. It is a little over-corrected to the red ray region when used with incandescent lights, particularly if these lights are not burned up to their rated voltage, as is often the case. This line drop of voltage is much more detrimental when incandescent lights are used, and the Electrical Department must supply the correct voltage for the rated voltage of the lamps, or the full efficiency of the new film is lost and the quality of photography is below standard. I have found that for render-

(Continued on Page 40)



Photographed on regular fast film without gray base.



Photographed on anti-Halation film.

Photographic Lens Tests

by DR. W. B. RAYTON

IT IS possibly no more difficult to design a photographic objective than it is to determine completely and accurately the value of the result. It seems obvious that since photographic lenses are designed as instruments for photography it should be a simple matter to take a picture with a lens and thus learn completely and almost without effort all about the ability of that lens to make a picture. This seems reasonable until the process is analyzed whereupon the photograph will be discovered to be not only a test of the lens but also something of a test of the camera, of the photographic emulsion, and of the technique of the photographer and the laboratory man. Since most people fail to derive much mental satisfaction from the contemplation of a negative, the process usually involves making a print also and in motion picture practice this positive print is projected on a screen entailing another series of variable factors all of which affect the degree of excellence of the final result.

There is another way in which lenses may be tested. By means of equipment known generally as a lens bench the magnitude of the residual aberrations in a lens can be measured. The information given by the lens bench is useful to the lens designer and it permits some attempt at quantitative specification of performance but it is practically impossible for the imagination to transform lens bench measurements into a mental picture of the quality of the image the lens can form. Lens bench tests can prove whether two lenses are alike or not. If they appear alike in every respect they will undoubtedly perform alike in practice under the same conditions but if they are recognizably unlike in the lens bench tests it is generally impossible to determine what effect the recognized differences will have on the image quality of the lens without resorting to photographic tests.

The situation, therefore, is not all that could be desired even by one who has occasion to make comparative tests of lenses for his own information only and it is much more difficult for any agency such as a testing laboratory, for example, to find means for accurately and completely determining and expressing lens performance.

In the testing of any commodity there is apt to be a slight degree of suspicion on the part of the practical man concerning laboratory methods, a suspicion which like all others is founded on ignorance. It is manifested by the farmer in connection with the Department of Agriculture's tests of agricultural products and by the manufacturer in connection with

Bureau of Standards' tests. The so-called practical methods of test are "practical" sometimes because they are more rapid but sometimes, unfortunately, only because they are familiar. Laboratory methods are characterized by an effort to exclude extraneous influences to the end that only that quality of the commodity is tested concerning which information is desired.

In the realm of lens testing we might regard the making of actual pictures as the practical method and the lens bench examination as the laboratory method of testing. Objections to each have been suggested above. There is a method of procedure, however, that avoids to a high degree the misleading results obtainable by the ordinary photographic practice and at the same time escapes the uncertainties of interpretation encountered in considering the results of lens bench measurements. This method, although it may be considered a laboratory method, is a photographic one, but taking advantage of the conjugate relation between object and image planes, the photographs are taken in the plane ordinarily occupied by the object while the test object occupies the plane of the ordinary image.

Figure 1 shows in a schematic way the arrangement we have used. At the left is a source of light which may be an ordinary incandescent lamp or any other source desired. A condenser lens is employed to concentrate some of the light from the source into a reasonably parallel or converging beam. It is not important whether it be parallel or converging and in fact it is more of a convenience than a necessity for it is followed by a sheet of ground or "opal" glass to diffuse the light and to insure that the full aperture of the lens under test is employed. Immediately following the ground glass is a metal plate with a hole bored in it, mounted on a carriage which permits transverse movement measurable with a scale. For this arrangement a single plate with several holes in it can be substituted. If the spacing of these holes is chosen wisely no shift of the plate would be necessary and the test somewhat facilitated. The lens under test must be mounted perpendicular to the test plate and adjusted for focus until the hole in the test plate is imaged at the chosen distance on the image plane, the film plane shown at the right of the drawing. In this arrangement the photographic lens functions like an ordinary projection lens with the single but important difference that a plate of diffusing material is used between light source and object in order to avoid the danger of drawing false conclusions due to an incompletely filled lens aperture. This necessary condition has often been neglected in similar tests in the past and it cannot be too strongly emphasized here.

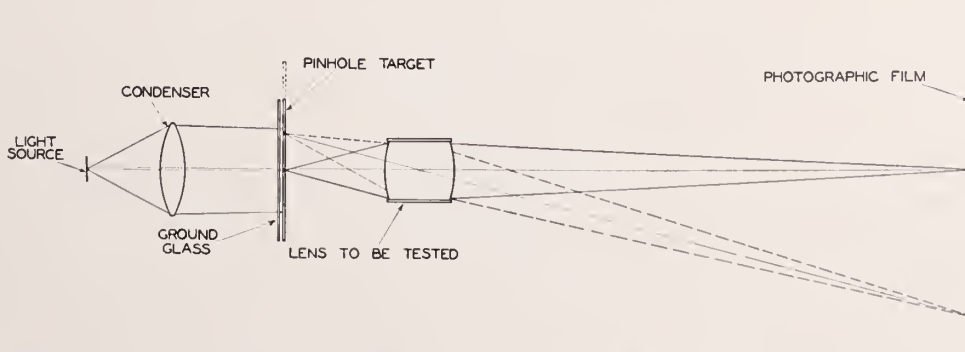


Fig. 1. Diagram of a proposed arrangement for testing photographic lenses.

With this arrangement completed the test is conducted by taking separate and consecutive photographs of the hole in the test plate, setting it first on the axis of the lens and subsequently moving it at right angles to the axis in steps of any desired amount until a distance has been reached equal to half the length of the diagonal of the picture the lens is required to cover. After the focusing has been perfected with the hole in the center of the field the focus adjustment is not touched during the complete test. In the case of motion pictures the length of the diagonal is 28.65 mm. In carrying out the test the time of exposure will have to be increased as the hole is moved farther from the central position for reasons connected with the construction of the lens to some extent, with the character of the performance of the lens and, more than anything else, with the character of the illumination. The difference in time of exposure thus observed is of practically no significance in reaching conclusions as to the performance of the lens. It should be self-evident that the image of the hole in the test plate will travel transversely as the test plate is moved going in the opposite direction and by an amount equal to the shift of the test plate multiplied by the magnification of the lens. This requires, therefore, that means be provided for moving the plate or film holder in a plane exactly perpendicular to the lens axis in order to make the various exposures.

The advantage of this test lies in the fact that all the aberrations of the lens manifest themselves on such a magnified scale that their effects are very large in comparison with the size of the grain of any photographic emulsion. If we choose a projection distance equal to a hundred and one times the focal length of the lens measuring from the front of the lens the magnification will be one hundred times. Interchanging object and image, that is reverting to the usual order, the reduction would be one hundred times or the magnification would be $1/100$ X. The ratio between the two magnifications will be 10,000. The effect of residual aberration will therefore be many times as great (but not 10,000 times) in the proposed procedure as in the ordinary use of the lens.

Any kind of photographic material desired may be used and the color of the light may be made anything from blue to red by means of suitable filters placed between the light source and the test plate.

The chart reproduced herewith, Fig. 2, shows the results of a test carried out in this manner with a 50 mm Raytar lens at full aperture ($f:2.3$) together with tests of four other well known types of lenses of the same focal length and approximately the same relative aperture. Differences in lens performance are detectable in the original prints with an ease and certainty unapproachable by the ordinary method. It is a question, however, how much detail will remain in the half-tone reproduction.

The test permits an interesting study of the effect of emulsion grain on the sharpness of the picture. The two circles reproduced in Fig. 3 tell the story. Of these two circles A was produced by a 50 mm Raytar at full aperture and is in fact the center shot of lens 4 in Fig. 2. Circle B was obtained in the following manner: A circular disc of white paper of the same diameter as circle A was mounted on a black background and stationed at the place where the photograph A was taken. In the place occupied by the test plate when A was taken a piece of panchromatic motion picture negative was located. The lens was stopped down until no spherical aberration could be detected and chromatic aberration was eliminated by means of a filter. Exposures were made of several different lengths and the best negative selected from the group. This was then printed on motion picture positive by contact printing. We now had a test plate that consisted of motion picture positive with a transparent spot in it whose diameter should have been exactly equal to the diameter of the hole in the test plate from which circle A was made. This



Fig. 3
Shows defining power of lens as compared with that of film.

positive print was substituted for the test plate, projected and photographed exactly in the same manner as before except that the lens aperture was reduced and a filter used to eliminate aberrations. The difference in sharpness of outline in the two circles is principally the result of emulsion grain.

From this experiment the conclusion is inevitable that in the center of the picture the lack of perfect sharpness while it depends on both residual aberrations and emulsion grain, the emulsion grain effect is greater than the aberration effect in most of the lenses tested. Getting away from the center of the field the aberration effect rapidly grows larger. Here the superiority of the Raytar lens is evident.

Reference was made above to the possibility of using such a test also to investigate the performance of a lens on different kinds of photographic material and for different kinds of light. Light differs, photographically, in respect of distribution of energy with respect to wave length. This is generally but not always apparent as a difference in color. Quality differences in motion picture practice are limited to a relatively small range. Incandescent lighting is doubtless somewhat redder than the ordinary arc or daylight but it is a mistake to think that it has no blue in it and it is equally erroneous to think that arcs emit no red and yellow light.

At any rate, the test described above permits employing color differences as radical as may be desired. Filters running from red to blue may be introduced between the light source and the test plate, where they cannot influence the performance of the lens by virtue of any optical imperfections in the filter, and tests can be made that will indicate the performance of a lens for any desired color. At the bottom of Fig. 2 are two series of shots marked 4 R and 4 Blue. These were obtained with a 50 mm Raytar lens focused with white light and exposed with a red and a blue filter respectively without refocusing. In spite of this very radical color difference the image quality is identical and the same as for white light. For this test an incandescent lamp was used and the filters employed were Eastman's Projection Red No. 24 and a C filter for the blue.

The result of the test was not surprising. The introduction of incandescent lighting and panchromatic emulsions into motion picture practice has led to some natural but generally unnecessary concern regarding color correction of objectives. This concern would have been well founded if low aperture lenses of 16 to 36 in. focus such as are used in commercial photography had been in question. The large aperture short focus lenses employed in motion picture photography are a different matter. For the former, the residual chromatic aberration of the colors other than those two for which chromatic correction is made, the so-called secondary spectrum, is of prime importance. In high aperture short focus lenses secondary spectrum becomes secondary in another sense. It becomes of less significance than other residual aberrations in the lens and also to mechanical considerations involving camera, film focusing, etc., hence the statement at the beginning of this paragraph.

Inasmuch as this subject has gone farther than speculation and conversation and has been discussed in the pages of this
(Continued on Page 22)

Projection Test Plates of 2-Inch Motion Picture Camera Objectives

1. This column shows definition at center of the picture. II. 5. mm from center III. 10. mm from center. IV. 15. mm from center.

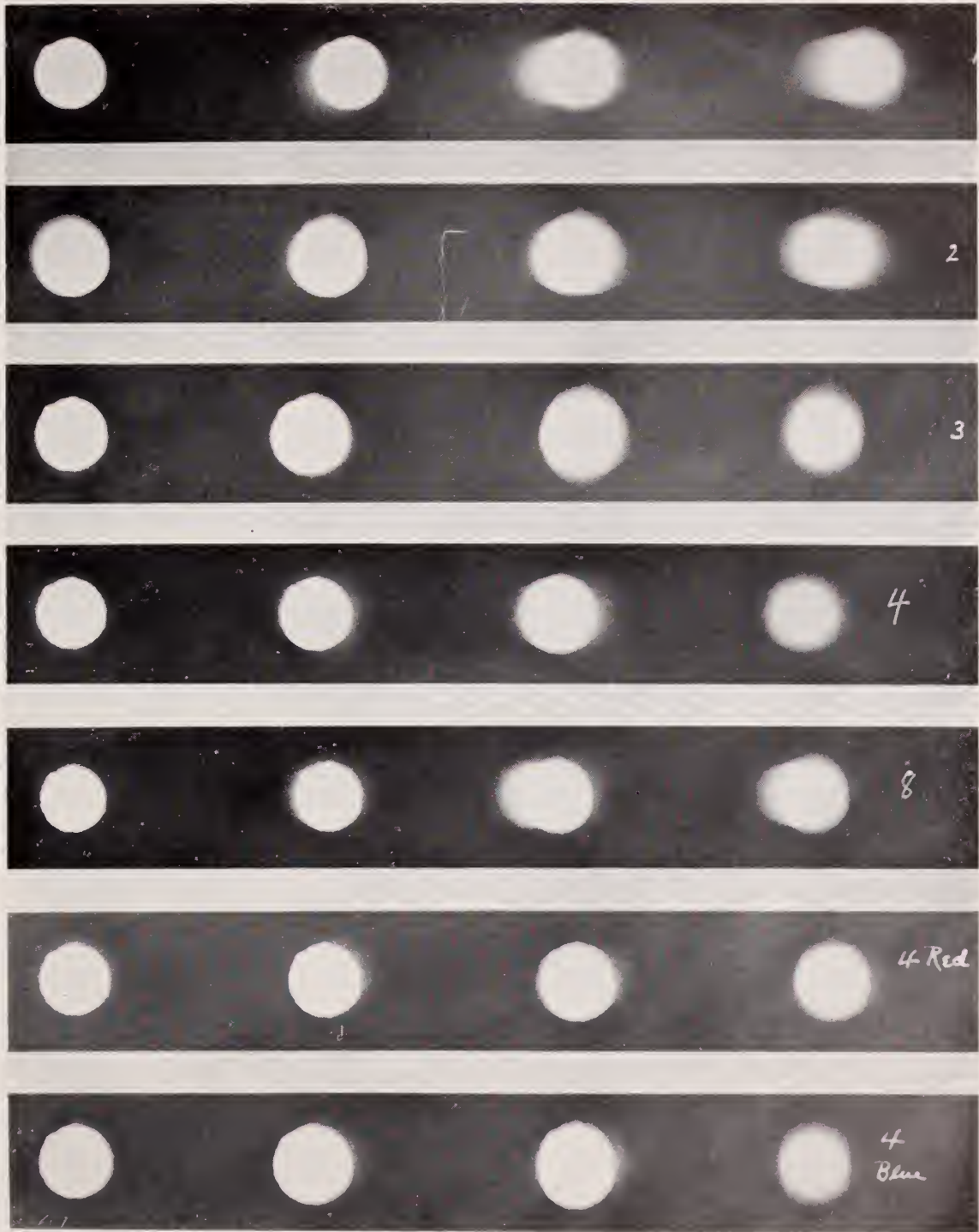


Fig. 2

Halation

by **DR. V. B. SEASE**

DuPont, Pathe Film Mfg. Corp.

HALATION is defined as a halo of light sometimes seen around the image of a bright object in a photographic positive print. In a negative it appears as a flare of silver along the edges of the bright object. It is most likely to occur in photographs of bright incandescent lamps, of strongly back lighted objects, of interior scenes including sunlit windows, or of the outline of a building against a blue sky.

It is clearly a phenomenon of scattered light. It is known that the crystals of silver halide in the sensitive layer may scatter light, but in the fine grained high speed emulsions of the present day it is doubtful if this scattering effect is ever responsible for more than a dulling of definition. True halation is caused by the reflection from the back of the film or plate of a certain amount of light which has passed through the sensitive coating. Sensitive coatings may be quite translucent. This is evidenced by the fact that in a bipack film a very strong image is recorded on the rear film by the light which has passed through the front orthochromatic emulsion.

The scattering which the light receives in passing through a sensitive coating means that some of the rays will strike the rear surface of the film or plate obliquely and will be reflected back into the emulsion at some distance from the edge of the image.

Halation is not a new phenomenon. It dates back to the days of the collodion plate. As early as 1867 we find an American inventor securing a patent on a black backing for collodion plates. Early workers encountered serious trouble with halation. They sought to remedy it in various ways. They recognized the fact that the rear surface of the glass or celluloid support was an excellent reflector of light, since the index of refraction of these materials is quite different from that of air. The surface of the support on which the emulsion is coated disappears because of the fact that the gelatine of the emulsion has approximately the same index of refraction as the support, so the early experimenters attempted to eliminate the rear reflective surface. They coated the back of plates with caramel, or other substances whose index of refraction is similar to that of glass. Dyes, lamp black, or other pigments were put into the caramel to absorb the light. Such back coatings accomplished the desired results. They were temporary and very easily washed off in the developer or in running water.

Other backing compositions such as asphaltum in benzene or such as pigments or dyes in collodion, gelatine, etc. were successfully used. However, a little more effort was necessary for the removal of those backings which were not water soluble.

There are many references in the literature to attempts at incorporation of dyes into the emulsion to prevent penetration by light. While the idea was fundamentally good, it was found that the dyes generally had a deleterious effect upon the photographic quality of the emulsion.

A number of schemes have been revealed for putting a substratum coating under the emulsion, capable of absorbing the light to which the emulsion is sensitive. An English inventor as early as 1893 disclosed a dyed gelatine coat between the emulsion and the plate. He claimed that the color might remain without serious annoyance in printing. Seyewitz recommended a coating of transparent red, orange or green dye between the emulsion and the plate. He noted that only a few dyes such as congo red and rosolic acid could be used, as most dyes diffused into the sensitive coating and reduced

sensitivity. He preferred that the dye should be capable of being readily bleached so as not to affect the printing from the finished negative. The dyed substratum coating was indeed a beautiful theory but was hard to put into practice on account of the tendency of dye to diffuse into the sensitive layer.

While searching for suitable dyes to try in a substratum coating, Sandell recalled that lantern emulsions were orange colored, and he conceived the idea of coating fast negative emulsion upon a lantern slide plate. His anti-halation results were remarkable. Thus originated the double coated plate which has enjoyed a wide popularity. Such plates owe their anti-halation quality, however, not to the color of the undercoat but rather to the opacity of the fine grained undercoat and its ability to absorb light. Undoubtedly this has proved to be one of the most satisfactory methods for prevention of halation, as the anti-halation coating disappears in the hypo bath and leaves a perfectly clear negative without any extra operations of removing backings or discharging dyes or pigments.

There have been numerous patents for brown manganese compounds in an undercoat. These compounds are capable of being destroyed in a strongly acid fixing bath. A German firm covered molybdenum ferrocyanide in the same manner. The alkali of the developer was supposed to destroy the ferrocyanide.

Other workers have described the use of a colored support to prevent halation. In 1894 an English inventor defined certain permanent colors for either support or sensitive layer. A Belgian inventor revealed the application of a violet tint under the substratum or on the back of celluloid film. Celluloid tints are not easily bleached out, but a violet or blue tint offers very little interference in making prints. Workers with tinted film like those with dyed undercoats, have confined their efforts to the use of colors which absorb in the spectral region in which the emulsion is sensitive. Any yellow or red dye is effective as an anti-halation tint with orthochromatic film but panchromatic film requires a tint secured with two or more dyes whose composite absorption curve has approximately the same shape as the spectral sensitivity curve of the emulsion.

Thus it is seen that the problem of producing anti-halation emulsions has been tackled during the past from every angle. Early workers probably had more difficulties than the photographer of today. Although they had much slower emulsions, these emulsions were coarse grained and, therefore, had low opacity which allowed much light to pass through their coatings. The modern fine grained emulsions with their high opacity have done much to relegate halation to a position of secondary consideration.

Early workers also had emulsions whose sensitivity was mainly in the blue end of the spectrum, while modern emulsions are becoming more and more sensitive toward the red end. A gelatine-silver halide layer has a good absorbing power for the blue, or short wave lengths of light, but it is much more easily penetrated by the yellow and red rays. So the tendency to increase panchromatic speed more and more has called the attention of the photographic industry again to halation. But with a background of much experience in combating halation, it is certain that this industry will not allow the quality of present day photography to suffer on account of this defect.



Eastman Gray Base Super-Sensitive Panchromatic Negative Film

by **EMERY HUSE**

West Coast Division—Motion Picture Film Department, Eastman Kodak Company

PHOTOGRAPHERS have always been troubled with halation in their pictures. This halation which appears as a spreading of light around all the highlights is due to light which has penetrated the emulsion and which is reflected back into the emulsion again by the back of the support. On glass plates where the support is thin, halation is very serious but with the thin film base it is so much diminished that in ordinary photography it is negligible, and one of the variations which has always been claimed for film as compared with plates is the freedom from halation which the films give. Halation, however, is a relative matter. A spreading of the light which is utterly negligible in an 8 x 10 picture may be serious in a small film and very serious indeed in a motion picture frame. Negative film has, therefore, for years been

made with a double coating of emulsion so that in addition to the other benefits conferred by this procedure, halation is reduced to a minimum. When working with glass plates photographers have been accustomed to diminish the effects

of halation by coating the back of the plate with a "backing," which prevented the light from being reflected from the back of the glass and which could be removed during or after development. Backing is a messy operation and the soluble backing in the developer is not at all desirable but its variations in the diminution of halation have led to its wide spread use. The conditions of the motion picture industry are such that it has not seemed desirable to place a soluble backing on negative film but fortunately the same result can be obtained in another
(Continued on Page 39)

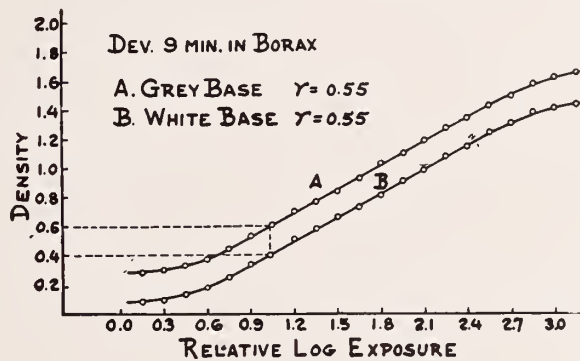


Fig. 1



Fig. 2



Fig. 3

The Leica Invades the Studios

With Some New Features Devised by Jackson J. Rose, A. S. C.

NOWHERE does one see more mechanical advancement than in the field of photography. It was not so long ago that photographers would hide their heads under masses of black cloth as they crouched behind big boxes with glass plates. Today step into most any Hollywood studio and you will see a photographer with a tiny Leica camera taking action shots that would amaze the photographer of old.

And now, Jackson J. Rose, a member of the American Society of Cinematographers, has devised several new articles of equipment for this little camera which should make it still more popular. These new devices consist of a cine filter holder and sun-shade and a new carrying case.



Mr. Rose and his Leica

This new cine filter holder and sun-shade does much to add to the attractiveness of the little camera. It makes easy the use of the many density and color filters, which in turn makes it possible for a cameraman to make tests of lighting and composition; for the camera takes the 35 millimeter fast film, and exact and accurate results may be obtained. Already a large number of cameramen are users of the Leica. Among these men are Mr. Rose, Gilbert Warrenton, Tony Guadio, Dan Clark, Arthur Edeson, and many more.

The cine filter holder and sun-shade are made of aluminum and are finished in black crack-a-lak. It holds two 2-inch square filters or gauze mattes. It fastens to any lens of the camera and is grooved to hold celluloid gauze mattes. It will not interfere with Universal view finder and will not cut in on the widest angle lens and can be put on or removed in a moment's time. A spring flap prevents leak light from entering on lens or filters. Rather a clever device for the creating of which Mr. Rose deserves much credit.

The carrying case is an attractive case built of strong, three-ply wood, covered with grain leather and lined with corduroy. It has large tray for various accessories and holds the camera, 35 mm. lens, Universal View finder, three double magazine holders, cine filter holder and sun-shade, Winko angle view finder, Fodis range finder, cable release, tripod head, 14 two-inch filters and other accessories.



The new Leica carrying case

This little camera is a precision camera of the highest standard and is tremendously useful to the still man. Its cost of operation is negligible, for all the Leicas will never be able to consume the amount of short-ends which accumulate in the studios and which are often wasted entirely.



The Leica with its cine filter holder and sunshade.

The Leica camera equipped with the same fast film and lenses as the motion picture cameras, can be operated during
(Continued on Page 42)

Screen Definition

by **DR. L. M. DIETERICH**
Consulting Engineer

Part VIII

IN THE last article the production of a "circle of confusion" by a modern photographic lens was shortly characterized. Figs. 1 to 6 of this installment amplify such characterization in a graphical way and are enlarged line drawings showing approximate copies of actual photographs.

Fig. 1 shows the target, a white cardboard with $\frac{1}{8}$ " black circle C. A 50mm Zeiss Tessar lens f 3.5 was placed 15 feet from the target and focused upon it for Fig. 2. For Fig. 3 to 6 it was set for a 30 feet focus without changing its distance from the target.

The upper diagram of Fig. 2 shows the lens covered with the exception of two round holes H H' or apertures of 3.12mm diameter equivalent to the value of f 16 diametrically opposed on a center distance of 10mm. The lower diagram shows a sharp image C' of the object C.

For Fig. 3 where the plane of sharpness was advanced to 30 feet, we find the image consisting of two separate images C² C³ of slightly reduced sharpness or definition.

For Fig. 4 the lens covering was turned for 180° during the exposure showing the image of the target point as a true circle of confusion.

The identical result was obtained by removing the slotted lens covering and stopping the lens down to an aperture of 13.12mm dia. equivalent to f 3.81.

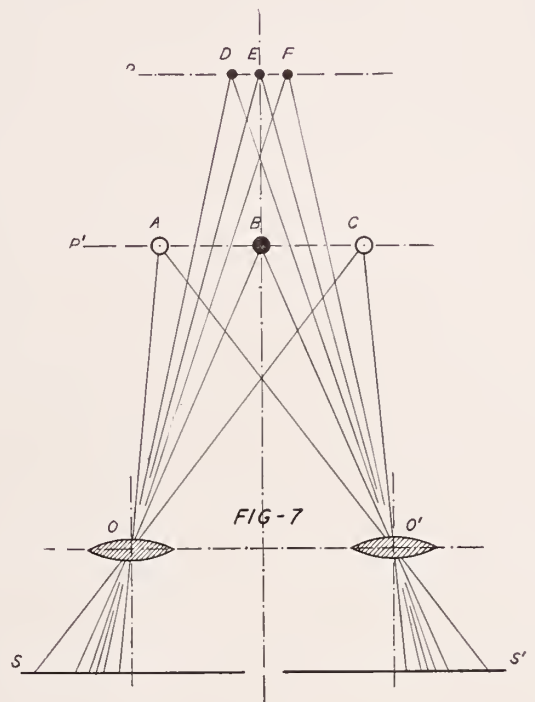
For Fig. 5 the two apertures H H' were joined to a slot of 3.12mm width and 13.12mm length. The image result shows an approximately elliptical dot with a darker core and unsharp outline.

For Fig. 6 this lens covering was rotated for 180° during one exposure resulting in a circular dot of the same diameter as the length of the elliptical dot (Fig. 5) along its major axis.

The image result, a circular dot or disc with a dark center, gradually fading towards its periphery, presents the well known out-of-focus unsharp disc image of a point misnamed a "circle of confusion."

A study of these diagrams discloses some of the characteristics of so-called stereoscopic photographs, i. e. photographs taken with two similar optical means in parallax or at a distance from each other.

These diagrams, however, show only the parallax effect for a two dimensional object.

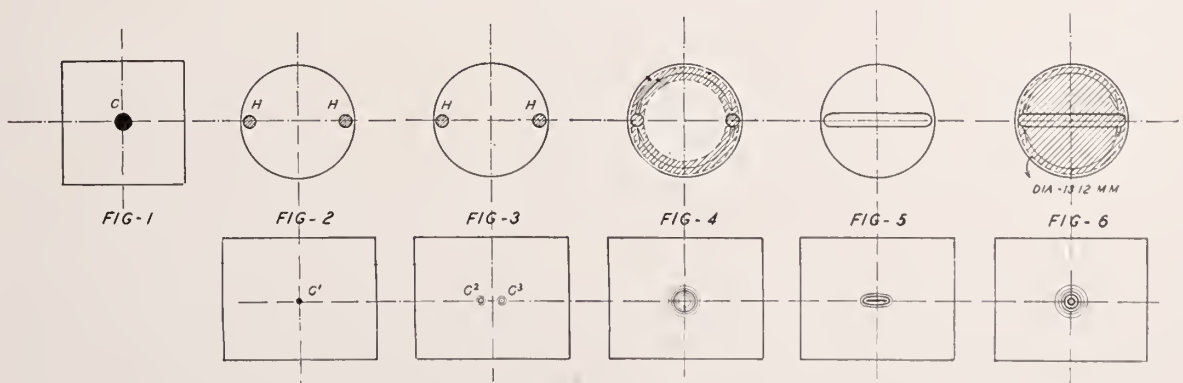


If we extend our observations to the three dimensional object field, conditions, of course, become more complex.

Assuming two fixed, horizontally separated lens apertures as shown in Fig. 2 and 3, comparable with bi-lens or binocular optical systems, and also for the present assuming that all object points are in focus, the analysis of diagrams Fig. 7 and 8 discloses fundamental characteristics of parallax photographs, known as "stereoscopic couples." For simplicity's sake, absolute symmetrical conditions are assumed.

Object points A B C are supposed to be in one plane of sharpness, P, and object points D E F in a plane of sharpness P'. The photographs or images of these points produced by the

(Continued on Page 21)



Hal Hall

SAYS



Congratulations

THE OTHER evening this writer had the privilege of seeing on the screen a motion picture called "Eyes of Science." It was a three reel picture made under the auspices of the Bausch and Lomb Company and showed how optical glass is made and dealt with the importance of optics in the field of science. But it is not of the subject we speak, excellent as it was, but of the cinematography. One of the finest pieces of master craftsmanship that this writer has seen. And it was photographed by Dr. J. H. Watson of Rochester, an amateur who would rather photograph than anything else in the world. The film was shown at a meeting of the American Society of Cinematographers, and when the last scene was finished these master artists of cinematography burst into applause that would have delighted the soul of any professional. A real tribute to a real amateur.

Credit

AS THIS page belongs to the editor on which to say just what he likes, we feel that none will think we are acting as a personal publicity representative when we say that Mr. Len H. Roos, member of the American Society of Cinematographers, and vice-president and general manager of the Tanar Corporation, deserves a little kindly comment. Always a hustler in the days when he was hopping from one corner of the Globe to the other as a free lance and newsreel cameraman, Mr. Roos, in slightly more than a year, has shown that you can hustle in the same way right here in Hollywood where so many are prone to take it easy and let the other fellow do it. Coming here a little more than a year ago seeking portable equipment that he could carry easily anywhere in the world, Mr. Roos met with disappointment. So he designed his own, started the Tanar Corporation and the result has been that he has been so busy as a manufacturer that he has had to give up cameraing. A real hustler, and a real fellow.

This Month's Cover

COURAGE is one of the most admirable qualities to be found in any man. The man whose face appears on this month's cover of this magazine has plenty of it.

Starting his life as a cowboy on an Oklahoma ranch, he has had one of the most colorful careers of anyone in pictures. From the ranch he joined a circus. Then he joined the army, cavalry, of course, and rose to the rank of Sergeant in three years. Then back to cow-punching. Then back to the army, and then back to cow-punching again. He then won a chance to join Miller's 101 Ranch circus in New York again. And from then on he was a riding sensation. As usual, he later drifted away from the circus and landed in Hollywood. At the Fox lot he received his chance and made good. Then he left pictures and took his own circus on the road and wound up broke. Sound pictures had come in, and everyone thought that westerns would be among the forgotten things of pictures, but this man stuck and Columbia finally gave him a contract to do eight pictures. That they were successes is shown by the

fact that they now have him on a three-year contract. Yes, sir, this fellow—Buck Jones, doesn't know what it means to be licked.

Three Cheers

A HEALTHY note has been sounded in most of the studios in the announcement by most executives that there will be no cutting of salaries. Columbia led the way and was followed shortly by most of the others. This is good business. There are many ways of cutting overhead in the studios that will mean real saving, while cutting a few salaries merely reduces morale and produces little if any saving.

Lakin Not Sold

JUST as we were going to press Frank Arrousez of the Lakin Corporation asked me to run a line telling the industry that the reports that have been current in Hollywood to the effect that the Lakin Corporation has been or is going to be bought by any of several business organizations is all wrong. "We are not going to sell our lighting business," said Mr. Arrousez. So that's that.

Verboten

THUMBS seem to be down on future gangster films. Sane and serious thought regarding this type of film causes one, quite naturally, to feel that it is unwise to place before the eyes of our children pictures in which all manner of gun-play is depicted. Our children surely meet with enough temptation without deliberately showing them how easy it is to "bump a guy off." To make the pictures interesting the producers cannot help but make at least partial heroes of the gangsters. This is a bad example to place before children and the many morons who find their way into the picture theatres. Gangster pictures should be barred, no matter how much drawing power they may have.

Less Dialogue

THIS WRITER is still tingling with the thrill he received a few nights ago when he had the privilege of seeing the late Mr. Murnau's last motion picture, "Tabu."

What a picture! And what food for thought for the motion picture producers! If you have tired of the mostly stupid conversation of the over-talking talkies, go and see this picture. You will realize that dialogue is not necessary if you have a story to tell and an intelligent man to direct it. It also proves that you do not need a galaxy of "big names". In this picture you see a group of native South Sea Islanders as the cast. You see an unknown native boy and girl in the leading roles, giving performances that are sublime in their naturalness. Your imagination is allowed the chance to run riot, you do not have to listen to alleged "wise cracks" and bad speaking voices and worse lines. And when the last scene has appeared and the lights go on you feel like cheering for pictures that are told with the camera rather than with bad conversation.

A. S. C. Recommends Fast Film

THE American Society of Cinematographers, after an extensive series of photographic and laboratory tests of the newly developed "Super Sensitive" and "Special" Panchromatic Negative Films (commonly referred to as "Fast Films") made by its Research Committee and by many of the members at large, does hereby formally recommend the use of these new emulsions for all phases of commercial production.

In the opinion of the Society's Research Committee, the results obtainable with these new films are, with respect to photographic quality, in every way equal to those obtainable with the previous Panchromatic emulsions, and in many instances definitely superior. In addition, the new films present many marked advantages of a commercial nature, which should commend their use from a purely commercial viewpoint.

The photographic qualities of this new film are such that a considerably improved picture can be had with a very considerable decrease in the amount of light used for illuminating the set; or, conversely, with the present lightings and smaller lens openings, improved definition can be obtained without sacrifice of those qualities of softness which have always been the artistic aim of cinematographers.

The color rendition of the new emulsions is considerably improved, which is of great benefit in studio interiors, and in exterior landscape scenes, and particularly noticeable when extreme telephoto lenses are used.

There is no difficulty in the laboratory processing of the new films. In fact, they are beneficial to the laboratory personnel, inasmuch as somewhat more latitude in the proper developing time is permissible.

The increase in speed, or overall sensitivity of the new films is considerable. This is of great commercial benefit to the producer, inasmuch as it permits reductions of 40 percent or more (depending upon the individual technique of the cinematographer in question) in the amount of current consumed in lighting any given set. This is best obtained by the use of lamps of lower wattage, rather than in the use of fewer lighting units, as the successful use of this film depends chiefly upon the maintenance of the proper balance of lighting, which

cannot be obtained by reducing the number of light-sources. In this connection, the development of more suitable, smaller, lighter lighting units for use with the smaller lamps suited to the new film, is strongly recommended as a measure which will vastly increase the speed and convenience of production. It is further urged, as is embodied in a separate recommendation, that the lamps used should be standardized at 120 volt units, and that the voltage delivered on the set should likewise be standardized insofar as is possible, at 120 volts.

This standardization of lamps and lamp voltage will go far to improve photographic quality, regardless of the type of film used, and to prevent retakes arising from photographic causes. The use of lamps of lower wattage will, as heretofore stated, reduce the current consumption by an average of forty percent, which, in the case of major studios, should mean an annual saving of approximately \$25,000. In addition, the use of the smaller bulbs will result in lowering the temperature of a set by more than 20 percent, which will be of direct benefit due to the greater comfort of the actors, enabling them to work more efficiently and with less fatigue, and to the fact that the lower temperatures will not cause makeups to melt and run.

To summarize: the new, so-called "Fast Film" emulsions will in every sense prove a definite benefit to the industry. They will give photographic results at least equal to and in many cases superior to the results given by the present Panchromatic emulsions, at a very appreciable saving in the matter of lighting current consumption, and with much improved working conditions for the actors. With properly designed lighting equipment, this saving should be heightened by a greater facility of operation. "Fast Film" presents no problems in laboratory processing, and, in the hands of a capable cinematographer, entails absolutely no photographic or economic hazard. For this reason, the American Society of Cinematographers, through its Board of Governors and its Research Committee, does hereby go on record as highly recommending the use of the so-called "Fast Film" in every branch of professional cinematography.



Laboratory Department

Conducted by EMERY HUSE, A. S. C.

Principles of Sensitometry and Their Practical Application

Part 3

THE foundation of sensitometry as practised today was laid, as aforesaid, by Hurter and Driffield about 1890. It is only natural that during the past forty years the principles originally propounded by them should be expanded and magnified. Although actual sensitometric procedure has changed appreciably, nevertheless the foundation laid by Hurter and Driffield was very important and it must not be lost sight of, that, but for them, photography would not, in all probability, have reached the high peak of perfection it now enjoys.

Any study which involves the measurement of sensitivity may be termed sensitometry. In photography use is made of this term and it may be defined as the science of measuring the light sensitivity of photographic emulsions. Inasmuch as such measurements involve the study of various sources of radiant energy and furthermore because the reaction of any photographic material to light is not evidenced until after development, the study of sensitometry must also involve developing solutions and the constituents entering into them. Therefore, photographic sensitometry in its broadest sense includes a study of the effect of all of those variables entering into the photographic process, both physical and chemical on the sensitive emulsion.

Sensitometry is applied in many fields. In the first place the manufacturer of sensitive materials uses sensitometry in the control of the product he is manufacturing. He also makes use of it in extensive photographic research work which leads ultimately to the improvement of such products. The users of photographic materials, such as astronomers, and quite extensively the motion picture industry, are making practical every day use of the subject in the maintenance of consistent results. It has been only recently that the knowledge and application of the value of sensitometry and its applications has been applied in the practical field. The last three years in the motion picture industry alone have seen an enormous increase in the practical application of sensitometric methods of control. This control was first applied to problems of sound photography but now control of both picture and sound is accomplished by sensitometry. The use of this science is increasing rapidly and with its use a fuller appreciation of its value is in evidence.

Before proceeding with the more detailed discussion of the many phases of sensitometry, it would be well to consider briefly the relationship between the logarithm of exposure and the densities produced by the development of the exposed photographic emulsion. These few basic points will be discussed later in full detail.

Briefly, the simplest method of measuring emulsion sensitivity of a photographic material is to subject the material to a series of graduated exposures and then subsequently develop it for a definite time in a predetermined developer. The resultant densities produced by development of the exposed strip can then be measured to determine the quantity of silver in each exposure of the graduated series. The quantity of silver is expressed in terms of density, which is defined as

$$D = \log O = \log \frac{1}{T}$$

where O is opacity and T is transmission. Knowing the exposure condition for every step, as well as the density, a curve may be constructed using as coordinates density and the logarithm of exposure, usually expressed $\log E$.

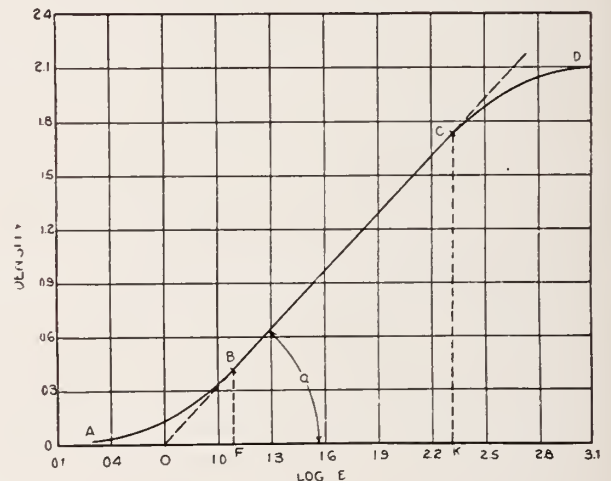


Fig. 1

Figure 1 shows a typical sensitivity curve for a definite series of exposures for a fixed development condition. This curve is also referred to as the H and D curve. The solid black line represents the smooth curve drawn through the actual experimentally determined points. An appreciable portion of this curve is a straight line, as indicated by the section BC, and represents the region of correct exposure, since in this region of the curve density is directly proportional to the logarithm of exposure and as a result brightness values rendered on this portion of the curve are directly proportional to the corresponding brightness values in the object. This direct proportionality is not maintained in the extremities of the curve. The section AB represents the under exposure, or toe portion, while the section CD represents the region of over exposure, or the shoulder.

The full sensitometric procedure to be valuable and useful necessitates very careful manipulation and involves the establishment of several fixed conditions. The first of these pertains to exposure and includes the standardization of a light source as regards quantity of light and quality (spectral composition), as well as a means of producing mechanically, or otherwise, a graduated series of exposures of known relative values. Secondly, development must be standardized. Following this it is necessary that a precise means of measuring density be set up and all of the three conditions mentioned above must be analyzed in a method of data interpretation, either in a statistical form or from curves. All of the material contained in these three articles to date is to be considered only as an introduction to the general subject matter of sensitometry. The next logical step is a consideration in detail of all the elements entering into the practical applications of sensitometry. The first of these deals with exposure and the next article will begin with this subject.

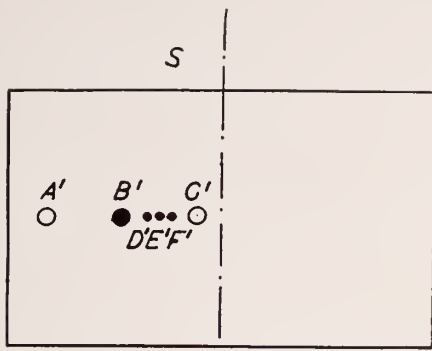


FIG-8

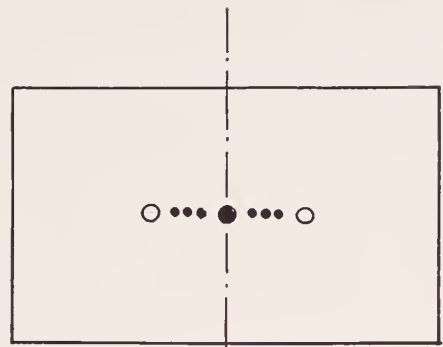


FIG-10

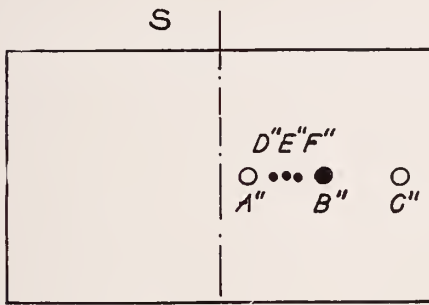


FIG-9

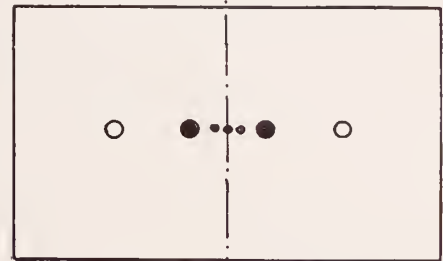


FIG-11

Screen Definition

(Continued from Page 17)

two identical recording system O S and O' S' are shown in their relative position or location values at S and S' and in Fig. 8 and 9.

Analysis (geometrical and otherwise) shows that the images of one plane object points in one plane of sharpness can by proper shifting of the center lines be brought into registration by superimposing directly or by projection the two images S and S'. Image points A¹ B¹ C¹ and A² B² C² will coincide. Disregarding these image points, the image points D¹ E¹ F¹ and D² E² F² can also be made to coincide. If either of these groups coincides, the other image group, however, appears as a double image. Fig. 10 and 11.

In Fig. 10 A¹ B¹ C¹ coincide with A² B² C² or show a single picture of A B C, whereas D E F is shown double. In Fig. 11 D E F is shown as a single picture whereas A B C appear overlapping.

This short discussion intends to prove by simple graphical means that it is impossible to combine a stereoscopic couple into one true image of a three dimensional field.

Comparing these endeavors to produce natural vision effects by photographic means, other fundamental characteristics in natural vision have to be considered and analyzed. Automatic focusing and simultaneous convergence of the two axes of the eyes and the effect of the spiral ranging of sharp sight shall in the next article be shown as so far unattainable by photographic means—even in a theoretical sense.

As all these articles are restricted to motion picture screen presentation, they strive to analyze these screen results as presented to the "unaided" eye.



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Photographic Lens Tests

(Continued from Page 12)

journal it will not be inappropriate to look into the subject a little more in detail. We have no quarrel with any type of color correction that yields good results but we believe that it is misleading to claim there is only one type which is satisfactory. In spite of the fact that achromatic telescopes have been made since 1758 lens designers are not in complete accord as to just how achromatic telescope objectives can best be corrected for color. There is no convincing evidence that within the limits of the argument one type is not as good as another. For visual instruments of all kinds each lens designer prefers or is satisfied with color corrections possibly slightly different from those preferred by other designers and yet all of them may produce equally reputable instruments.

One reason for this, of course, lies in the fact that generally only two colors can be brought to a common focus. That means that there is necessarily a multitude of other colors coming to all sorts of other foci. If we were dealing with light of only two wave lengths the problem would be relatively simple but we have to deal with light of all the colors in the visible spectrum and the choice of which two wave lengths to bring to a common focus becomes a problem which probably does not possess an unique solution.

There is another complication, however, in the fact that if the designer brings together into a common focus two wave lengths for a given zone of the lens, say the central part of it, these two colors do not have a common focus for any other zone, say the marginal or an intermediate zone. Hence, anyone undertaking to describe the color correction of a lens, to be accurate, must state what zone he is discussing and how the color correction varies from zone to zone. He may say that he is talking about the average effect of the whole lens for a given color when he states where the focus is for that color. This, however, is possibly still more difficult to fix than it is to prove that a given color correction (which comes very close to being a meaningless expression) is the best one to adopt. The statement that if two colors are brought to a common focus for the center, let us say, of a lens the same two colors will not have a common focus for the margin, implies the existence of spherical aberration in one or both colors. You may rest assured that there is spherical aberration in both and that it is different in amount in these two colors and that furthermore spherical aberration exists for all other colors in still different amounts. An earlier article in this journal reports data supporting the above statements. (1)

In the presence of spherical aberration it is difficult to say what the position of best focus is—it is, in fact, impossible. Visual and photographic judgment will differ and, to make matters worse, photographic judgment will differ with exposure. Then, too, diffraction adds its bit to render the position of best focus indeterminate until with everything considered it takes sublime confidence to state where either the best visual or best photographic focus lies even for monochromatic light.

In view of this uncertainty of position of best focus, a subject discussed by H. Dennis Taylor in a very interesting little book on *The Adjustment and Testing of Telescope Objectives*, it is surprising to read in a recent paper (2) published in this journal that a certain lens of 3 in. focus should have chromatic aberration of 0.003" according to computation but that in actual practice it was found to measure less than 0.001". Now, to be certain that there is chromatic aberration greater than zero and less than 0.001" in a 3" focus lens means that the position of best focus for each of the colors in question must be determined with an error smaller than 0.0005". In view of the uncertainty of the exact position of a focal point it is a fair question whether mere reproducibility of measurement may not have been regarded as a proof of accuracy.

The explanation advanced for the discrepancy between computation and measurement amounts to saying that the picture

is taken principally by means of the light which is brought to a focus at the film and that light which is not in focus has comparatively little effect. If this is true it can easily be shown to constitute another reason for the fact that it is impossible to prove that any one type of color correction is superior to all others.

This argument is not intended to lead to the conclusion that the distribution of residual color aberrations in a lens is a matter of no concern and that it can be left to chance with the certainty of acceptable performance but it is intended to show that there is no reason to believe that slight changes in the type of color correction of motion picture lenses will result in any better average performance.

The test proposed above is a laboratory test in that it eliminates practically all of the uncertainties which are able to lead so easily to false conclusions when lenses are tested in the ordinary way but at the same time it is a practical test in that it is photographic and its results are interpretable without much effort of the imagination. They are identical with an enlargement perfectly executed of a photograph taken in the ordinary way but on a practically grainless infinitely thin emulsion with almost perfect precision of focus and with a perfect camera. The tests need nothing to supplement them to disclose all the characteristics of the performance of a lens except a test for distortion. This, in fact, could be determined from a test of this sort but it would have to be carried out in a somewhat different manner. The tests reveal the fact that the Raytar lens is unequalled by any of the well known motion picture lenses in its even quality of image over the area of a motion picture frame and that color differences much more violent than any that occur in motion picture practice do not ruffle its placid disposition.

In closing, the writer wishes to say that he has partially completed experiments on another type of test which when finished he hopes also to lay before the Society in another paper.

(1) Bielicke, *American Cinematographer*, September 1928, page 13.
(2) Dubray, *American Cinematographer*, November 1930.

The Silent Mitchell Camera

(Continued from Page 9)

deavors have done so much to aid us in perfecting this machine."

Mr. Mitchell is perhaps unduly modest, for when this writer inspected the camera he found it to be exceptionally quiet; most of what little noise there was being very evidently traceable to the driving motor. In its present state, the camera appears to be sufficiently quiet to use uncovered in many instances, and with only the lightest of insulating bags under every condition. With more silent motors, the new camera should be suitable for almost every studio purpose. In any event, it marks a great step forward in cinematographic engineering and practice.

The Research Committee of the American Society of Cinematographers will shortly undertake a series of both scientific and practical tests of the silence of this camera, the results of which will be published in an early issue of this magazine.

Schoedsack Leaves to Make Bengal Picture

ERNEST B. SCHOEDSACK has completed his staff and will leave this month for India to make the jungle sequences for "The Lives of A Bengal Lancer," which Paramount will release next season.

AN IMPROVED METHOD OF BLOCKING OUT SPLICES IN SOUND FILM

Now the sound track need no longer be painted out at the joints to silence splice noise. The Eastman Sound Film Patch enables the laboratory worker to block out joints with greater ease, speed, and uniformity.

The patch is made of light-weight, opaque film. For convenience in handling, it is provided with a quickly detachable finger tab. With the aid of this tab, a simple but accurate registration block, and cement, the patch is quickly applied to the film.

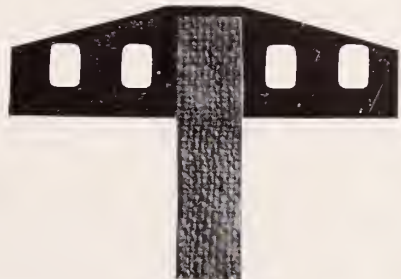
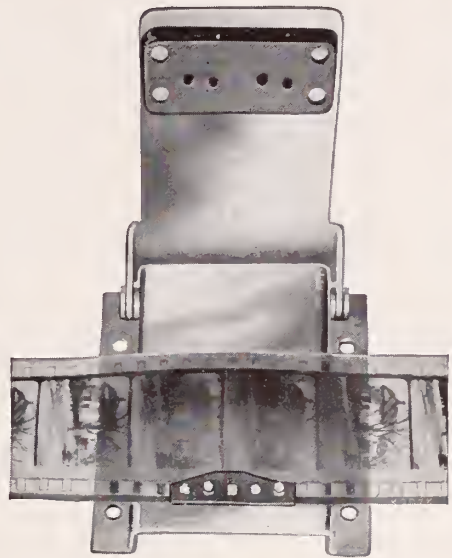
Because of its design, the patch is practically inaudible in projection. At the same time it obscures a minimum of the sound record, and assures fast, accurate treatment of all splices. These factors make the patches and the block a valuable feature of Eastman Service.

Eastman Sound Film Patches, per
thousand \$5.00

Eastman Sound Film Patcher
(registration block) 4.25

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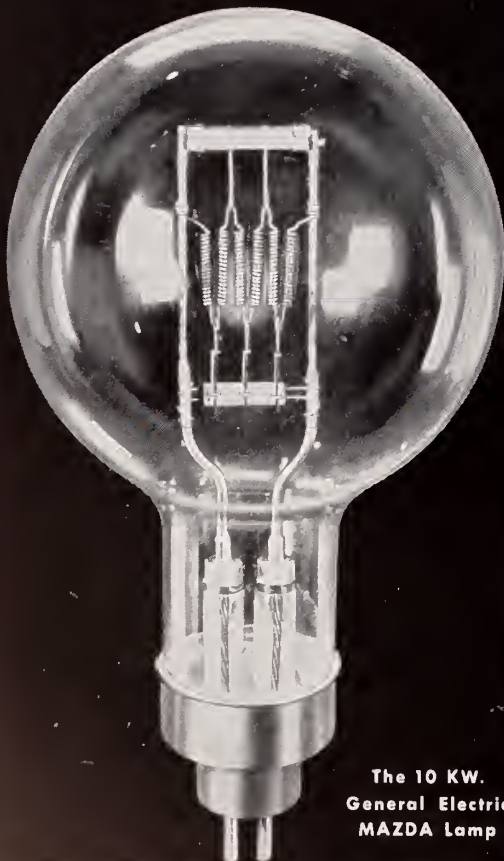
BIGGER ROLES IN PICTURES!

THE 10 kilowatt General Electric MAZDA lamp for photographic purposes has become more serviceable, more indispensable to the cinematographer than ever before.

This is because alert equipment manufacturers everywhere have perfected new equipments that enable the 10 k. w. lamp to realize every lighting potentiality . . . to operate to its fullest advantage in every lighting capacity.

The 10 k. w. lamp, substantially lower in cost this year, is particularly indispensable on large sets where it must be at considerable distance from the subjects being photographed. This lamp, with the fine new equipments available, forms a lighting unit that is easily set up, simply operated, flexible in its uses and thoroughly satisfactory. National Lamp Works of General Electric Company, Nela Park, Cleveland, Ohio.

Join us in the General Electric program, broadcast every Saturday evening over a nation-wide N. B. C. network.



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.. In the Realm of Sound ..

Chronograph Reverberation Meter

AN ANNOUNCEMENT from Western Electric states that the Bell Telephone Laboratories have devised an electrical method of measuring reverberation time by a reverberation meter. This has been done for the exclusive use of the Acoustic Consulting Service of Electrical Research Products.

"In the past" says the announcement, "time measurements have generally been made by a method originally used by W. C. Sabine, in which an observer measured with a stopwatch the length of time required for a sound of known intensity to decay to threshold as measured by the ear. This method gives surprisingly consistent results where the decay is slow and in the absence of noise. Where the decay is rapid, however, or in noisy locations, this method is rather difficult of application. Also it is a recognized fact that uncertainties may be introduced because of the variation in threshold between observers and with time in the same observer.

"The electrical method is similar in principle to the Sabine method, the primary difference being in the substitution of an electro acoustical ear of controllable threshold sensibility for the human ear.

"An electro acoustical ear or microphone converts sound energy into electrical energy which is amplified and rectified to operate a relay. This relay is so constructed that when the rectified current exceeds a certain value the contacts open and condenser is charged by a battery. When the sound energy, which has been converted into electrical energy, drops to the lower limit of sensibility of the relay, the contacts close discharging the condenser through a spark coil causing a spark to jump from a discharge point to the drum. The drum is rotated at a known constant speed. The discharge point may be set at any place on the scale. If the amplification of the amplifier is then varied in definitely known amounts and the point is moved along the scale accordingly, a series of points representing the decay of sound energy will be recorded if waxed paper is placed upon the drum. This method, therefore, gives graphically an exact history of the decay of sound from which the reverberation time may easily be obtained if the speed of the drum is known.

"In the measurement of reverberation time the source of sound may be anything which provides a constant energy level, the sources most commonly used being an oscillator or a frequency record with an associated reproducer and amplifier. The source is carried through a key associated with the meter, so that the tone may be interrupted.

"The employment of this instrument yielding the exact history of the decay of sound has permitted fundamental research in the behavior of sound decay in complex auditoria. It has contributed to the development of a new fundamental formula of decay which is now commonly used and is known as Eyring's formula. Due to the fact that the decay of sound is shown graphically with this instrument, a double reverberation time has been found in some cases. This double time may have been suspected, but previous to the development of this instrument it has never definitely been measured; due to the fact that other methods of measurement give only the total time for sound to decay a given amount. The cause of this double slope has been discovered and eliminated through the use of this instrument. It has also proven of great value in determin-

ing the effect on reverberation time of coupling rooms, either acoustically or electrically.

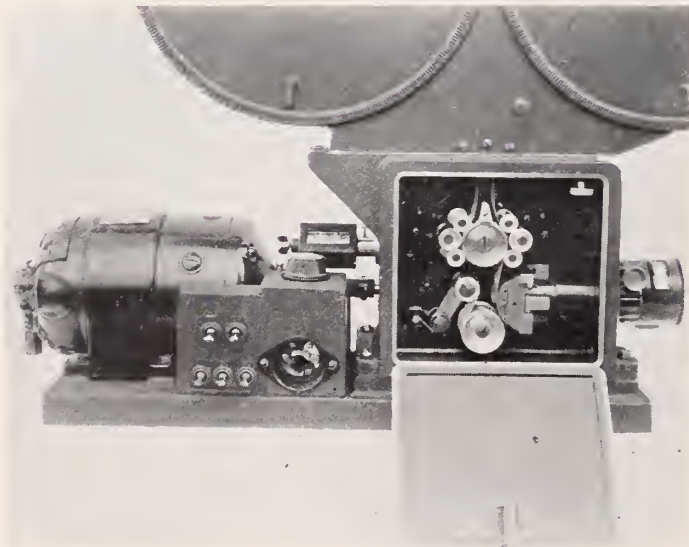
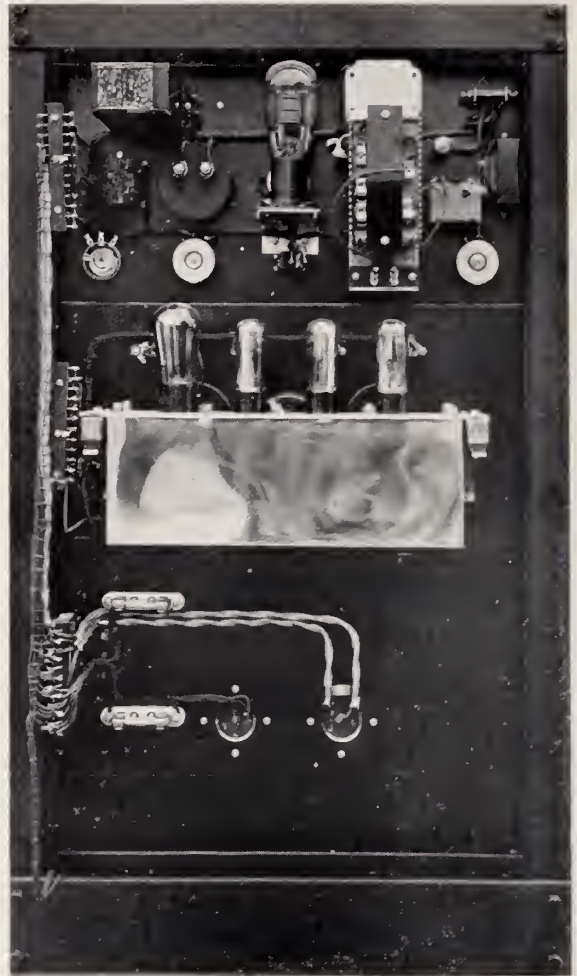
"In addition to its uses in purely research fields, this reverberation meter has a wide commercial application. It has been successfully used in the measurement of reverberation time of theatres, review rooms, sound recording stages, sound picture stages, broadcast studios and other auditoriums. Its use has given the reverberation time-frequency characteristic of the auditoria measured, thereby permitting more accurate correction of their acoustic condition. This is more than is ordinarily done in the mere computation of an auditorium in which consideration is generally given to acoustic conditions at only a single frequency. The meter has also been used in the measurement of the acoustic absorption of sound absorbing materials by the reverberation chamber method giving more consistent and more accurate results than any other known method."

Operation and Uses of Sound Meter

THE MEASUREMENT of loudness of sounds has in the past been generally confined to audiometric methods. As the name implies, these have involved the judgment of an observer, and some standard source of noise. Such measurements, while useful, are not essentially accurate, depending upon the skill of the observer and changes in the physiological and psychological condition of the individual. Moreover, the readings so obtained are only relative, and if sounds are of different character, the readings are apt to be misleading. Measurements by instrumental means have been, in general, of no comparative value and were generally expressed in some arbitrary units selected for the particular measurements at hand. Values so obtained bore, in general, no relationship to the physiological effect; i. e. loudness, annoyance, or any other reaction of a human observer. Moreover, the inability to establish a common point of comparison made it impracticable to make relative judgments between any two sets of readings.

The sound meter herein briefly described is based upon the fact that the effects of noise are primarily interpreted through the human ear—it was developed by the Bell Laboratories for exclusive Erpi use. The instrument is, therefore, designed to record the effects of noise in terms comparable to the loudness sensation as judged by the ear. It consists essentially of a microphone, amplifier, weighting network, indicating meter, and necessary battery supply, contained in two cases, both together being portable by one man. The microphone picks up the sound, converting it into an electrical current which is a counterpart of the original sound. This is then amplified by a vacuum tube amplifier and actuates a meter reading the loudness of the sound directly in decibels. The decibel scale is an arbitrary one in which each unit represents approximately the smallest change in loudness that can be detected by the normal ear. Zero of this scale is near the threshold of hearing or the point at which sound becomes inaudible in a very quiet place. Since the apparent loudness of a sound of specified energy is not the same for all frequencies, the amplifier is adjusted by means of a weighting network to stimulate the sensitivity of the ear. At frequencies near 2000 cycles per second, the amplifier is most sensitive and decreases in sensitivity with increase or decrease in frequency from this

(Continued on Page 29)



The Mitchell Recording Camera.
 The film is driven by the upper sprocket, the lower roller being free to revolve with the film. A quartz wedge, mounted in a one mill slit, in the slit block assembly, transmits the light from the recording lamp to the moving film. This slit block provides an absolutely smooth and non-abrasive surface to the passing film, and can not clog or fill as does an open metal slit, thus eliminating the possibility of scratched film and varying recording sound levels caused by loss of light through a partly clogged slit.

Upper right is back view of the Amplifier Rack. The upper panel represents the Noise Reduction Amplifier and associated equipment. Below, in the center, suspended on rubber shock absorbing cushions, the high gain recording amplifier, sealed against moisture in a metal catacomb, is mounted. On the power and terminal panel at the bottom, may be seen the two system power protective fuses, and the shielded speech leads to the extended mixer panel.

Part grouping and overall shielding provide maximum efficiency. All leads are cabled and protected against moisture, and handy terminal strips for all circuits are available.

A metal shielding and protective cover fits closely over the entire back of the assembly, to complete the protection. The overall gain far exceeds the maximum necessary for all purposes, and the amplification characteristic presents a straight line of equal amplification over all audio frequencies from 50 cycles to over 8000 cycles.

Upper left is front view of Amplifier Rack. This iron channel relay rack mounts, at the top, the new noise reduction amplifier, in the center the high gain recording amplifier, and at the bottom the extended mixer power and speech cable terminal panel. These panels are metal and of the finest machined appearance. The dials and knobs on the upper panel control the percentage of ground noise reduction and other recorder functions. The four meters are, top left: High voltage; top right: recording light carrier current and volume indicator; lower left: amplifier tube current; lower right: filament voltage. The row of buttons at the top of the center panel allow the instant measurement of the current of any tube in the amplifier. One switch, on or off, at the bottom of the center panel, controls the entire system.

A New Studio Sound System

Los Angeles Firm Introduces Equipment Designed for Independent and Foreign Producers

DESIGNED to meet the needs of independent and foreign motion picture producers, the Radio Installation Company, of Los Angeles, has introduced a new studio sound system to the industry. It is known as the "Rico" sound system.

According to officials of the Radio Installation Company, this equipment was designed by their engineers after an exhaustive study of the needs of the independent and the foreign producers who found it difficult to meet the cost of the higher priced sound equipment. This survey was made by one of the company's engineers who spent the greater part of a year in the foreign production centers.

Briefly, the "Rico" sound system employs the double system of recording. A Mitchell recording camera is used, driven by a Westinghouse motor tied in synchronism with one or two associated camera drive motors, all controlled by the switches mounted on the sound camera, and are thus available for one operator. A tachometer and footage meter are also provided. The equipment also includes a portable extended mixer and volume control panel. This may be placed on the set in view of the action and the recording engineer may mix the three microphones furnished with the set, if that many are used.

The makers of this sound unit have incorporated the new method of noiseless recording in their equipment. Another very important feature of the equipment is the fact that it has been designed for use in any and all climates. Throughout the entire system elaborate precautions have been taken to guard against moisture, the bugbear of the tropical climates.



Output Current and Recording Light Calibration Set.

Of inestimable value to the recording engineer is the Output Measuring Set provided, with which the recording lights are calibrated and the percentage of ground noise reduction is set. This unit is mounted in a compact and sturdy metal case, and is factory calibrated.



External Portable Mixer, Over All Gain and Volume Indicator Panel.

The first three positions from the left are the mixer controls for three condenser microphones, the switches below the dials providing a direct addition or removal of any of these microphone units, at will. The right hand dial is a master mixer or overall gain control, and below, the plug for the recorder's headphone. In the center above, the recording light carrier and volume indicator meter is located.

This panel, coupled to the recording rack by long electrically shielded cables, may be taken on the set in action, where the recording engineer may "mix" the sound from one or all of his microphones, all within sight.

The front panel is of metal and the entire unit is carefully shielded.

The following list gives the complete "Rico" unit as it is shipped:

High Gain Recording Amplifier. Latest Noise Reduction Amplifier. Three 2-Stage Condenser Microphones. Two Synchronous Camera Drive Motors. Two Camera Silencing Covers. Portable Extended Mixer. Mitchell Sound Recording Camera. One Microphone Boom. Power Supply Generator Set. Twelve Tested Recording Lights. All Cables, electrically shielded, for microphones, extended mixer and Camera Motors. Two Recording Camera Magazines. One Output Testing Meter. An additional list of 35 items make up a "spare part" list also furnished.

On the amplifier rack are mounted the noise reduction amplifier, the high gain recording amplifier and the extended mixer power and speech cable terminal panel. A metal shielding and protective cover fits over the entire back of the assembly. The company engineers say that the overall gain far exceeds the maximum necessary for all purposes, and that the amplification characteristic presents a straight line of equal amplification over all audio frequencies from 50 cycles to over 8000 cycles.

For example, the entire high gain amplifier unit is impregnated in a catacomb to protect it. Every part that can be affected by moisture is specially treated, and the makers declare these parts to be absolutely moisture proof.

Bell & Howell Announces Automatic Sound and Picture Continuous Production Printer

"ECONOMY," coupled with the highest "quality standard," is the watchword of the Motion Picture Industry today.

The inception of sound pictures and their universal acceptance by the theatre-going public have exacted from the technicians of the Motion Picture Industry the application of knowledge accumulated through the efforts of scientific research throughout the country.

During the short life of sound pictures, rapid strides have been made which have resulted in great improvements in sound recording and reproduction.

It is obvious that the printing of release prints of utmost quality so as to assure the best possible presentation of the picture and the most faithful reproduction of sound is an essential factor in the success of any sound picture production.

The Bell & Howell Company has created a "new fully automatic continuous sound and picture production printer," which is now being exhibited and demonstrated to the Motion Picture Laboratories on the West Coast.

This apparatus, which is the result of several years of experimentation by the engineers of the Bell & Howell Engineering and Research Laboratories at a cost of over \$200,000, permits the simultaneous printing of both the sound and the picture records, and its fully automatic operation suggests its comparison with the automatic screw machine which has practically revolutionized machine shop practice and its economics.

The following will outline some of the revolutionary features of this machine:

1. **FULLY AUTOMATIC OPERATION:** After being set up, the printer does not need any further attention except for threading it with raw positive stock.

It runs in either direction so that the negative, after the initial threading, does not require further handling nor inspection.

2. **LIGHT CHANGES:** These are secured through the use of a film travelling matte running between the printing light and the printing aperture. A positive and instantaneous change of the light intensity without alteration of its spectral characteristic is thus obtained for each scene and, if desired, for any portion of any scene. The light changes have been divided into thirty logarithmic steps, ranging from one to thirty, each step representing a ten per cent exposure increase over the preceding one. The latitude of exposure from lowest to highest is sixteen times.

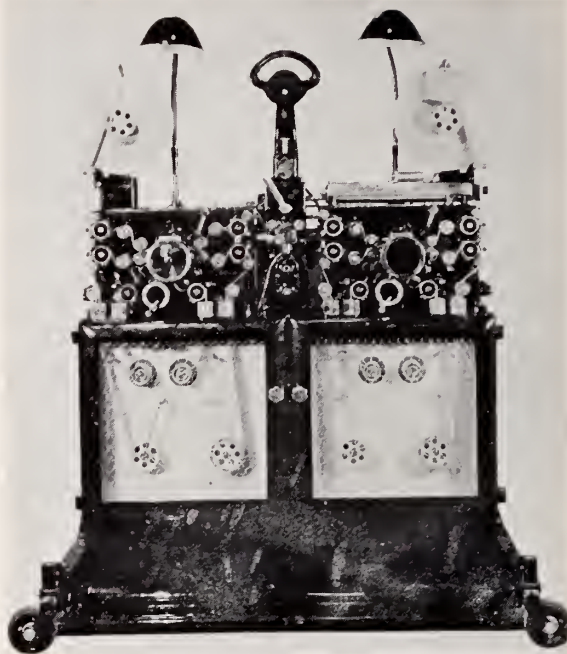
The film travelling matte is inclosed in a dust-proof compartment together with the negative, and the handling of both (after the original setting) is therefore eliminated regardless of the direction in which the machine is run and the number of prints that are to be made.

3. **PRINTING LIGHT:** Standard 250-watt, 110-volt, T-20 monoplane filament bulbs on prefocusing base are used.

4. **PRINTING SPEED:** A speed of sixty feet per minute is recommended. The machine can be especially adapted for higher speeds if desired, in which case lamps of higher wattage up to 500 watts can be used if necessary.

5. **PRINTING VALUES:** The densitometric control of the printing light values is absolute for a predetermined development "gamma" which insures at all times the exact duplication of print densities for both the picture and the sound records.

6. **CONTACT:** Intimate contact of the negative and positive films is secured by air pressure. Two cushions of filtered compressed air are formed at both back faces of the films at the printer gate. This eliminates frictional contact of the films with the printing aperture and the aperture gate.



The New B. & H. Printer.

7. **REGISTER:** An improved main sprocket similar in design to that of the B & H model D printer insures perfect registration within maximum tolerable limits of film shrinkage.

8. **CLEANLINESS OF FILMS:** Combination compressed-air and vacuum units cleanse both the negative and the positive film as well as the film travelling mattee before entering and after leaving the printing apertures and prior to winding at the take-up reels. This double action assures perfect cleanliness regardless of the direction in which the machine is operated.

9. **TEMPERATURE CONTROL:** The heat generated by the printing lamps is dissipated through an ingenious cooling system, which insures the proper temperature for all parts of the machine as well as a comfortable temperature for the printing room irrespective of the number of machines in operation. The cooling system also insures dust-proof lamp chambers.

10. **LUBRICATION:** A fully automatic lubricating system supplies the proper amount of oil to all working parts of the machine every two minutes. A minimum of personal attention is therefore required. Special precautions have been taken to prevent the escape of the lubricating material, especially at film-contacting or any external points.

11. **DRIVE:** The machine is positively driven throughout. All film guide rollers are of the dry ball-bearing type. The motor is of the synchronous type insuring constant speed.

12. **BAFFLE LINES:** A special printing head is provided to print (simultaneously with the picture and the sound records) two black baffle lines (or light shields) between picture and sound record and between sound record and film perforations. The key-number printing for both sound and picture records is done at the main heads.

The above main features of the apparatus suggest by themselves the utmost accuracy and duplication of results in "release printing," as well as considerable economy in operation due to the almost complete elimination of the necessity of constant personal attention and the time-saving factor which it involves.

Several protection features have also been incorporated, rendering the printer entirely "fool-proof" and eliminating all possibilities of wastage.

(Continued on Page 40)

Operation of Sound Meter

(Continued from Page 25)

value. The dynamic characteristics of the meter are also adjusted to simulate the ballistic qualities of the ear. Thus the meter indicates visually to an accuracy of about one decibel, the extent to which the ear is affected by a sound. The range of the meter, in the interests of portability, is slightly less than the range of the ear. However, it is not anticipated that it will be required to measure to absolute threshold, nor sounds of actually painful intensity; and for practical problems the range is, therefore, adequate.

Where a continuous graphic record is desired, a level recorder may be substituted for the visual indicating meter. The recorder can be adjusted to produce a graphic record of sound covering any period of time. The substitution of this device for the visual indicator alters the dynamic characteristics of the meter, since mechanical limitations preclude any possibility of a recording device fluctuating as rapidly as noise. However, if peak noise levels are not required, the level recorder is extremely satisfactory.

The meter alone merely indicates loudness and gives no information relative to the character or frequency distribution, which is equally important in any noise study. The frequency distribution may, however, be determined by the meter in conjunction with an analyzer attachment. Either broad band analysis to determine general characteristics of noise, or single frequency analysis for an exact determination of individual components may be made.

The meter because of its accuracy and ruggedness has allowed loudness studies of sound, which hitherto could not be accomplished with existing equipment. With the meter, observations may be taken under the most severe conditions, since the meter and observer may be at any convenient location, and the microphone placed at the point desired.

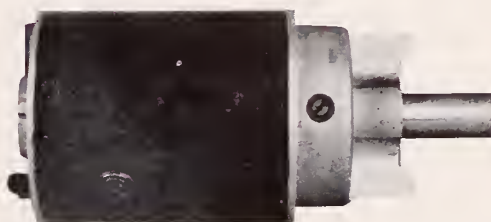
Obviously, the uses to which the meter can be put are manifold; surveys of noise conditions, determination of acceptable levels in various types of buildings, compliance of equipment with specified levels, are typical of one field of employment. Studies of loudness of other sounds, such as music, with relation to the performer or with relation to the architecture of the auditorium, represent another type of application. The control of uniformity of manufactured products by means of acoustic measurements is itself a wide and distinctly useful field.

Certain limitations in the use of the noise meter must be observed since it cannot discriminate between different sounds but indicates the total loudness of all sounds picked up by the microphone. Consequently, if it is desired to measure a sound not appreciably louder than others striking the microphone, it is generally necessary to stop all sources other than the one creating the sound to be measured. In some instances, it is possible to measure sound not appreciably higher or even less than the surrounding or background noise by use of the analyzer, providing the sound differs considerably in frequency composition from the background noise. The analyzer is adjusted to pass the frequencies of which the sound is chiefly composed and reject all other frequencies. Consequently, sounds of relatively high level, providing they do not fall within the band passed by the analyzer, will not affect the meter reading. Other limitations include the acoustic conditions surrounding the measurements, which must be fully accounted for to avoid errors.

Low-Price Photophone

AN all-AC-operated sound reproducing equipment designed for theatres of small capacity up to 500 seats has been launched by RCA Photophone, it is announced by Sydney E. Abel, general sales manager. At the same time the company has placed in effect new and more attractive terms of payment. The special equipment, priced at \$1,600, may be acquired by exhibitors for a down payment of \$100 and \$25 weekly for two years.

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Amateur Movie Making

by WILLIAM STULL, A. S. C.

DECIDEDLY, the most important development of the month, as far as 16mm. cinematography goes, is the introduction of Super Sensitive Reversal film. Fast negative film has proven a boon to the professional cinematographer, and Super Sensitive Reversal film should prove even more useful to his amateur brother. It will make it possible for the amateur to photograph under lighting conditions that would previously have been utterly impossible. It will enable him to get his normal exterior scenes with better color-rendition, and smaller lens openings. It will enable him to use his extreme telephoto lenses to far better advantage. And it will open up to him a whole new field of artificial-light cinematography.

But—caution must be observed in the use of this new film. The results obtained from any film are governed directly by the amount of thought used in making the picture, and nowhere must more care and thought be used than with this new emulsion. It offers great opportunities for technical improvement of one's work, and at the same time, gives equally great opportunities for the sort of failures that arise from careless, thoughtless work. When these failures happen, one must try to discover just how they came about, rather than immediately damning the film as useless.

The first, and most obvious point to be guarded against with this film is, of course, over-exposure. Over-exposure is always dangerous in reversal film work, as the reversal process accentuates its unpleasant effects; with Super Sensitive reversal film, over-exposure is positively fatal. Therefore, cut your exposures down vastly below what you think will under-expose—and then cut them down some more! For exterior work, fast film will give you a chance to become familiar with the neutral density filters which, though rarely used by amateurs, have proven themselves indispensable to professional cinematographers. Furthermore, this new film will give you a chance to become familiar with the orange colored "G" filter, which is very useful, and with the red "A" and "F" filters, by which you can get very interesting night effects by daylight. These filters are not, I believe, regularly furnished in mounts for 16mm. cine-camera lenses; but you can get them in the 2" square flats, and use them in any of the several adjustable holders made to take this size and adapted to almost any lens.

Another point that requires particular attention with this new 16mm. film is the matter of lighting. This film tends naturally to give a somewhat softened image, so naturally the lighting of the subject must never be flat. More than a few professional cinematographers have come to grief on this point; they forgot that improved speed does not necessarily mean exaggerated contrast. Therefore in lighting scenes for this film, bear in mind that the emulsion will not create contrast where there is none, and light your scene accordingly. For exteriors, the best lighting for general use is a cross-light, or, at times, a back-light; but never a flat front-light.

For interiors, the new film has tremendous advantages. You can use vastly less light than you would otherwise. For ordinary medium close shots, you can get excellent results with only 300 to 500 watts. Therefore you can now make interiors without having to invest heavily in lighting equipment, although the efficient reflectors of the better amateur lighting units will still prove of great benefit. But, what is most important, by using more light-sources, of smaller wattage, you can begin to attempt the artistic modeling effects that you see in professional pictures. Instead of using but one or

two lamps, you can use four or five small ones, and arrange them so that you get the best out of your subject.

Furthermore, with this new film, you can have a great deal of fun trying for unusual lighting effects. Since fast film came into studio use, it has been a standing joke that some cinematographers used so little light as to make it seem that they were virtually lighting their sets with matches and cigarette-lighters. Now the amateur, with his smaller sets, can go the professional one better, and actually use matches! I have lately seen tests made by amateurs on the new fast film in which the only illumination came from the match which the subject used to light a cigarette! Obviously, the possibilities of the new film for such trick lightings are endless. Furthermore, if one already has the lighting equipment required for interiors on the older film, he can, with the new film, illuminate larger areas, and get long-shots as well as closeups.

Taken as a whole, the introduction of this new film for 16mm. use is probably the greatest boon ever offered the thoughtful amateur, for it will enable him to do many heretofore impossible things with his camera, and to do the accustomed things better. Most important of all, however, it will force him to proceed more cautiously and thoughtfully with his work, which, in the long run, should prove of far more benefit than is directly obtainable from any new film or lens, for, after all, the little grey cells are the most vital accessory to any camera.

Making It Interesting

With the coming of summer, everyone of us has outlined any number of films to be made. There is no dearth of subjects; but the question arises, how can we make the subjects, which are so interesting to us, into films that will be equally interesting to the other fellow? This is quite the same problem that the professional producer encounters in his daily work. He must please an audience numbered by the millions; and he has more than his personal pride (however important that may be) at stake; he has hundreds of thousands of dollars invested, which must be made to come home to roost, bringing some profits with them. So, how does he go about making a picture?

First of all, he studies his subject, whether it be a drama, a travel-film, or a purely documentary reel. He decides just what is the essential part of the subject, and how this essential thought can best be brought out. Then he prepares a written blue-print of his picture—a scenario or script. From this more or less detailed outline, he proceeds to make his picture, making sure first, that the whole outline is perfect, and then that each scene as it is shot is likewise perfect. Then he assembles his film, and again eliminates all that is unessential. And there is his picture!

The same method can well be followed in personal filming. Of course, it would be foolish to prepare an iron-clad scene-for-scene script for a personal film-record of a holiday, but it is even more foolish to attempt to make such a record without giving some thought beforehand to the elimination of the unessential details. Similarly, in making record films, you should decide what sort of technique you want to apply. Will your film be treated as a straight newsreel, as a personal memoir, or as a sort of drama. Will you, in other words, just make an ordinary record of the occasion, will you photograph what are, to you, the high spots of the party, or will you

(Continued on Page 47)

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Upper left, Morlaix. Showing off the new sabots. Upper center, Churchyard gate, St. Jean du doight. Upper right, Street, Morlaix. Left center, Baptism of Christ in Church, St. Jean. Center, Head of St. Jean. Right center, One of the beautiful "treasures" Chalice at St. Jean (N. D. Photo). Lower left, St. Falaise. Lower center, Fountain of St. Jean. Lower right, Grand Hotel St. Jean et des Bains.

Babbling About Brittany

by LAWRENCE GRANT

This is the fourth article of an unusually interesting series which Mr. Grant has written for this magazine. The next will appear in the August issue.—Editor's Note.

MORLAIX is quite a pleasant change in so far that I do not recall anything for which it is famous, at least famous and interesting to travellers. It is a very busy manufacturing place though, lace, and tobacco holding first rank as far as I know. It is a good center for your headquarters while making side excursions to very interesting villages within easy reach. It has an art gallery, and a bridge or viaduct which is quite the sight of the town. The little city is built on two levels, the busiest part being in the valley, and this very high bridge spans the main section of the town.

It is an imposing engineering accomplishment, probably it would be described over here something like this: "Morlaix is spanned by a fine viaduct which passes over the city at considerable height, and is a good example of building skill." But the French "Guide Johan" says: "Le viaduc monumental, qui domine la ville, lui donne un caractere special, un aspect a peu pres unique en France." And somehow, that seems to make it sound better than it is. I always think that the French words used in ordinary talk, such as "monumental," and the music of the French language, make everything sound more splendid and more promising than events bear out, and I believe that is why diplomats chose the French language for interchange of notes and the drawing of treaties. They sound splendid, but don't mean so much.

These two levels are connected by some narrow and picturesque alleyways for pedestrian traffic. Please see the woman in the one illustrated lifting her skirts as she gets in front of the camera to show off her new sabots, which very likely were made at the little factory we saw at Lannion in the last chapter. These alleys are picturesque, but picturesqueness at a price, as it is all over Europe. Imagine—a pretty girl—a moonlight night—the steps of an old city—ivy covered walls—steps worn by mailed feet of Kings and Crusaders—distant music from the town below—compatibility—propinquity—unity of desire and purpose—and then—smells—smells made by—well, anyhow—**smells**—that drive romance away, and you to fresher air.

Whether it is "Pardon" time or not, St. Jean du doigt, a little to the North and by the sea must be visited, and not only this fascinating sleepy little place, but its neighboring villages Plougasnou, Tregastel, and Locquirec. You see here how reminiscent of Cornwall that is,—"Tregastel," and how it calls to mind the old doggerel:

"By the Tre- Pol- and Pen-
Ye shall know the Cornishmen."

and you will find all over Brittany these "Tres and Pols and Pens" abounding, with "Ker-" as an alternative prefix to names.

You will probably stay at the Grand Hotel St. Jean et des Bains, which again sounds like an imposing caravanserai with minions and varlets around you, whereas it is really a quaint and lovely little inn, full of paintings, all of Brittany subjects, left there by artists for sale.

This place really is one of the famous ones. For its "Pardon," for its church "treasures," for its Fountain, and as far as I am concerned for damp beds.

Damp beds in out of the way places and in "off season time" are not uncommon in Europe. There are several devices

for testing them, and it is just as well to be provided with one of them.

"What is a damp bed?" you ask.

In America owing to every house being warm throughout they are, providentially, unknown. But in Europe, alas, they are common. It simply means one of two things, or both. Either the whole bed has long been unoccupied, and with no central heating, the room and everything in it has become damp, or the sheets having been washed and properly ironed, have not been put in front of the fire, (the usual way) or in a dry warm room to take the final dampness out. Or both these things are existing. An experienced traveller can tell by putting his hand in between the sheets before retiring, and certainly he can tell after being in bed for a minute or two. Also you may put a hand mirror in the bed, and draw it out quickly. If it has a filmy appearance on the glass then the bed is damp. You can buy special detectors for the purpose. But no matter how you find out, and I beseech you to find out, if damp, do not sleep in that bed.

The strongest constitution cannot stand against it, and you will either immediately or in the course of a day or so be ill, in some one of various ways, and either mildly or seriously according to your robustiousness.

After the Grand Hotel St. Jean et des Bains I got as far as Landivisiau, when without a moment's warning I had my first introduction to lumbago. Had I not been robust, and had I not enjoyed excellent health always, I should probably have had pneumonia. However into bed I was carried, and of course, knew nothing of how to proceed. A little French doctor came, and having no electric pad, no rubber hot water bottle, either of which is all you need, he proceeded to deliver heat in such an old fashioned, ingenious way that I wouldn't have missed it for worlds.

He opened a box in which eight little individual custard glasses were stored. Then he tore off eight little pieces of absorbent cotton. He placed a piece in each cup. Then he turned me over, and bared my lumbar parts for the fray. He picked up glass number one, took out the cotton, and lit it. Then he replaced it in the cup, and approached me stealthily.

With a quick and deft motion he pressed the circle of the cup on my quivering flesh. Of course the lighted cotton immediately ceased to burn for lack of air, as was intended, but the warmth remaining in began to "draw" on the pain. He repeated this operation with the other eight glasses, till my back resembled a group of crystal mole hills, and the "drawing" was quite noticeable and rather comforting, or should have been, but in recounting this I have made one misstatement, for his deftness abandoned him on the last glass, air was not immediately excluded, the cotton continued to burn, and a small portion of me, like my namesake St. Lawrence, was suitably grilled. I carried the mark for well over a year.

I had to stay in bed for several days, and when I recall the gentle hands of the two comely Inn maids who tenderly lifted me and looked to my least want, I wonder if it was not pre-ordained in my lucky stars after all.

One other thing should be taken along with you, a collapsible rubber sponge bath. Hot water in vast quantities will be willingly carried to you, but you will find few bath rooms, and few even common tubs for bathing.

The Church of St. Jean possesses a large and marvelous collection of "Treasures," of which the most ornate and beautiful are the Chalice and Cross, both glorious examples of gold-

smith's art. Then they have many other treasures of less intrinsic value, but immeasurable religious worth. As they appear listed in a published book to be obtained at the Church, I will quote from it: "Le doigt de Monseigneur Saint Jehan, (this means the finger of St. John Baptist) enchasse en argent dore; la teste de Monsieur Saint Meriadec, aussi enchassée en argent, (and I hope this is either the "last will and testament" or an old fashioned way of spelling the word "tete" (head) but maybe it is what it sounds like for they make relics of strange parts and pieces in Brittany) une image d'argent de Monseigneur Jehan Baptiste; une fasce avec deux oells d'argent; seize calices d'argent (sixteen chalices for one little village church!); trente deux chandeliers de cuivre, deux croix," and finishes—"la liste est interminable." And I believe it.

I like the old wording "Monseigneur" for St. John and only "Monsieur" for St. Meriadec. It displays a nice sense of distinction in a democratic spirit. At the Revolution all titles were swept away, and everyone became "Citizen" with a gradual acceptance of "Monsieur" as a form of address after the first violent revulsion against "class" had passed by. So we have in France "Monsieur le Duc" this, and "Madame la Comtesse" that, democracy seeming to be satisfied with the retention of title so long as the revolutionist prefix of "Monsieur" goes before it. So the Saints were democratized also, and "Monsieur" is placed before "Saint," but in the case of the Great Fore-runner, they stretched the order of precedence and made him a "Monseigneur."

Now, when you enter the church, in front of you and arresting your attention immediately is the Baptism of Christ by the "Monseigneur" in colored statues; it is the piece de resistance of the place, and as the proper construction of a group representing one full grown man baptizing another presents certain difficulties of posing, the ingenious mediaeval artist hit upon the simple expedient of making John considerably taller so that the act becomes easier to portray.

Bits and pieces, personal and private pieces, of Saints are grouped together in a frame below the big group of the giant John baptizing the diminutive Jesus. Bits of the arm of St. Modeste; of the leg of St. Alexandre; of the palate of St. Anthony; two unidentified, but very interesting looking bits of St. Generosi; a small portion of Ste. Fortuna; and a rather excessive and intimate bit of St. Benigne.

All the labels are clear and in place, but unfortunately some of the "bits" have fallen to the bottom of the frame. I could not help speculating, if ever they should be replaced, as to who would determine just which was which, and how shocking it would be if the piece, the very interesting piece, of St. Generosi should happen to be put where Alexandre's leg should be, and the leg credited to St. Generosi. However, probably the finger of "Monseigneur" would come to their aid and infallibly indicate their correct reassignment.

The Fountain of granite and metal in the church yard again shows St. Jean baptizing Christ, while at the very top a benign God of curious shape, looking, I must confess, like a gorilla, regards the matter with smiling favor. The water starting from the top is so directed that a spray continually drops on the head of Christ, thus eternally baptizing him.

Inside the church on the wall hangs a salver. A most realistic representation, again in natural colors, of the head of St. Jean, and I wish you to notice that his headless body is behind the salver which is held in his own hands. Rubbing heads on his head is very beneficial for ills of the head. The colors were so faded that it was hard to get a clear showing of this relic.

The finger of St. Jean, or rather the silver case containing it, is rubbed on the eyes of all people during the festival week, and though rubbed on each with only the most perfunctory wipe of a towel, thus apparently spreading rather than curing eye trouble, I did notice that the great majority of people there did not need spectacles.

On "Pardon" days crowds come from surrounding villages bringing their banners; young girls dressed as brides carry the treasures in procession; a little lad dressed as St. John leads a lamb by a ribbon; and they proceed up a hill to where a great bonfire is prepared. On the church tower a priest lights a torch, releases it to a taut wire from him to the bonfire, the peasants stand round the pile of wood, the torch slides down the wire, the fire is kindled, and all the crowd call out: "An Tan! Antan!" ("the fire—the fire"). This torch is called the dragon, and the custom is of great antiquity.

There is one peculiarity about the "Pardon" of St. Jean du doigt. At all these celebrations in other places, when the day's religious exercises and processions are over, the evening is given up to jollification of various kinds, carousing and singing for the older men, dancing and such other "divertissements" as commend themselves to youth, peasant as much as peer, and these gaieties may continue, as at Guingamp, into late moonlight parties, in the square, in the lanes, in the woods, whence no one has to "walk home," because the situation which causes so much unwilling trudging over here, would never arise over there on these intimate and privileged occasions.

But at the "Pardon" of St. Jean du doigt they do not dance. For did not the great John the Baptist lose his head through a dancer? This prohibition is of great antiquity. Many years ago one man held a private party in his cottage, and there was a little quiet dancing, but by morning a fire had destroyed the place and all the people in it. This was so obviously a visitation of divine wrath, and **not** drunken carelessness with a match, that the lesson has never been forgotten.

From Morlaix it does not take us long to get into another kind of Brittany, the district where you will see most of the curiosities called "Calvaires." These Calvaries are dotted about here and there and were, I think, erected after the cessation of a great Plague. They are large monuments which carry on the top of a solid base, a reproduction of the Crucifixion, with the three crosses, and Roman soldiers, and weeping followers grouped round the center cross.

Round the sides of the large base is generally told the story of the Life of Christ, and at the corners some special incident, or outstanding figure, the latter, however, frequently departing from the biblical story to record some outstanding bit of local history or legend. For instance in the corner of the Calvary of Plougastel-Daoulas a lady of good family in the district, but of ill repute morally, is shown as being thrown into hell by the devil. She was guilty of having robbed a guest staying at her chateau of all his very costly clothing and having given these things to her lover, who immediately turned out to be the Devil himself; so she is depicted in the sculpture without any clothing at all, a rare figure in church carving, most of the figures not only being fully clothed, but dressed, not as you would expect in the traditional flowing garments of the bible period, but in the Breton's dress of the 16th and 17th centuries, which was much the same as it is today. So you will see the twelve apostles and other familiar characteristics in the "Brag-o-bras" which is Breton for "plus-fours" and the large felt hat with long velvet streamers. Nothing new under the sun, all this was done ages before modernist actors thought of playing Hamlet in modern dress.

But the most unexpected and delightful things in and around this mid-west coast are the costumes, especially those of the school children. It is the enchanted land of "Kate Greenaway" come to life. The boys with large floppy caps having small peaks, short, eton shaped coats of brightest blues and greens and browns, loose ties, wide trousers of buffs and greens, and the girls with long skirted dresses of every shade and color, even the faded condition of many of them adding to their artistic effect. Their little close fitting cap will have as many as three different colors, with embroidery between each section. Coming from other villages, where bright colors and heavy embroidery may be reserved for Sundays and holi-

(Continued on Page 39)



Three upper photos, Plougastel. Picturesque children of the "Kate Greenaway" country. Left center, Part of Calvary of Guimilliau. Center, Young girls at St. Jean du doight selected to carry the relics. Right center, Calvary of Plougastel. Lower left, Well of St. Salaun at Folgoet. Lower center, Crowd buying at a village boutique. Lower right, St. Salaun at Folgoet.

Supersensitive Film for Amateurs

Eastman Kodak Company Announces New Fast Panchromatic Safety Stock for 16 mm. Cameras

ONE of the most important announcements that has ever been made in the 16 millimeter motion picture field is the news from the Eastman Kodak Company that the new supersensitive panchromatic film is now available for use in the 16 mm. cameras.

This remarkable new film puts an entirely new aspect on the subject of personal movies. The extreme speed and high degree of color sensitivity of supersensitive film batters down many of the photographic barriers of the past. Motion pictures can now be made of subjects that could not be photographed satisfactorily before.

The following is taken from the manufacturer's announcement and gives details of interest:

"Pronounced sensitivity at the red end of the spectrum makes the emulsion of this film particularly efficient when exposed to rays of artificial light—especially light of incandescent lamps. As a result, the range of cine activities is signally extended.

"With supersensitive panchromatic film, it is now possible—in fact, easy—for amateurs to photograph subjects indoor by the light of ordinary electric lights. No longer is it necessary to use expensive lighting equipment to obtain indoor movies.

"To say the least, the imagination is taxed in attempting to conceive of all the numerous new channels of interesting movie making that are now open. As a striking example, your living room can be quickly transformed into a temporary studio simply by placing two or more 100-watt bulbs in as many reading lamps. With your lens set at f.1.9, you are all ready for first-rate home movie portraits; close-ups of the children; or numerous interesting subjects that do not require the source of illumination to be more than a few feet away.

"Lighting effects that are different—and beautiful—can easily be obtained by placing additional lights at the sides of and behind the subject. One lighted bridge lamp set behind the subject produces a "back lighting" which gives a pleasing depth and roundness to the picture. See Fig. 1. It should be understood that the **direct** rays of artificial lights should not be allowed to enter the lens. Lighted floor lamps and table lamps can be included in the picture, and will not cause fog or halation if the bulbs do not show through or under

the shades. It must be remembered, however, that brilliant pictures can only be made when there are additional lights (out of range of the camera) for direct illumination.

"By increasing the number of electric bulbs, the camera can be placed farther from the subject thereby increasing the scope of the picture. For instance, in Fig. 2 the camera was twenty-one feet from the group. The diaphragm opening was f.1.9, and six 100-watt lamps were supplemented by two 60-watt bulbs placed in a reading lamp.

"An exposure table for Cine-Kodak supersensitive panchromatic film when it is exposed under artificial light conditions is given:

Exposures Table
for Cine-Kodak Supersensitive
Panchromatic Film

These exposures are for the Cine-Kodak operated at normal speed. Halve the illumination at **half-speed**.

Distance from Lamps to Subject	Diaphragm Opening	Total Wattage of Lamps
2 feet	f.1.9	200
2 feet	f.2.8	300
2 feet	f.3.5	400
3 feet	f.1.9	300
3 feet	f.2.8	450
3 feet	f.3.5	600
5 feet	f.1.9	600
7 feet	f.1.9	800
9 feet	f.1.9	1200

"Best lighting is obtained by arranging the lamps on each side of the camera, so that both sides of the subject are illuminated. It is advisable to place the lights at different distances from the subject. For example, the above table gives an exposure with the lamps 3 feet from the subject; the lamps can be placed 2½ and 3½ feet from the subject. Be sure that the camera is in a position so that the lights used for direct illumination will not show in the finder.

(Continued on Page 43)



Fig. 1



Fig. 2



Photographs by the Author

CAMERA STUDIES IN THE ARIZONA DESERT

by HATTO TAPPENBECK, A. S. C.

SPEEDING through the white sandhills near Yuma the heat increased to a terrific degree as we were nearing rapidly the Arizona border line. The few tiny white clouds over the western horizon, which had accompanied us thus far, evaporated like the steam from a tea kettle. Our thoughts went back with regret to the crisp breeze of the blue Pacific we had left behind us this very morning.

Hours later—the border hundreds of miles behind—there was a pleasant surprise in store for us. We had passed Phoenix and were now steadily climbing up the trail which leads into the land of the Apache Indians, where once their famous chief Geronimo reigned supreme; three thousand to four thousand feet altitude.

The heat decreased as we went up and above our heads small white clouds formed apparently out of nothing. Racing along the azure blue sky they grew into enormous size, but when they reached a certain spot above the middle of the desert the rising currents of hot air tossed them around and played with them till they had vanished as quickly as they were born.

The air four thousand feet up was cool and pure. Foliage trees crowded out the desert bushes and cacti of the lower regions. Soon we descended again to the latter. The air became filled with the smoke of the copper smelters, which with the gasoline stations and stores along the road form the only sign of white men.

Presently we left them behind and entered the Apache territory, where these former Indian warriors now follow peaceful and domestic occupations. They live in small round huts, not unlike a bee-hive with canvas covering on top. They resent intruding and avoid being photographed as much as possible, unless a generous tip changes their mind.

Here, away from civilization is the very paradise for the pictorialist during May and June, the time when the Arizona desert is in bloom! What a contrast with two months ago! Then the rain produced only a few tiny green leaves or sprouts on the end of the dried-up bushes and shrubs. Now everything is covered with new fresh growth. The reddish ground and rocks, undoubtedly of volcanic origin, are nearly hidden by an elaborate cloak of green and yellow. The latter color is quite predominating. However, nature seems to balance and blend the whole into a perfect painting, suitable for color photography, black and white, or actual subject on canvas as well. The colors are there, mostly in delicate pastel shades.

Green bushes have yellow blossoms, yellow shrubs are covered with white buds. The Giant or Sahuaro Cactus bear flowers like short-stemmed daisies, white petals with yellow centers, which open up by the dozen at the time and form a wreath or crown around the top of each of the arms which these Giants stretch towards heaven.

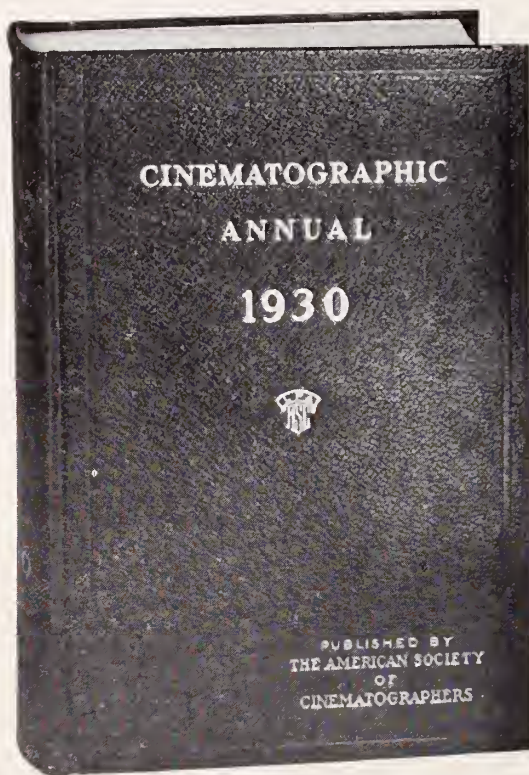
The smaller varieties of cacti, Choalla, Prickly Pear, etc., have blossoms and fruit of every tint of yellow, orange and red. The white high stemmed Yuccas can be found in the plains as well as on the slopes of the hills, and the roads are bordered by red, white and purple species of the thistle family. The ground in between is covered with wild flowers and thorny, low shrubs of wide variety, mostly colored from orange-red to magenta and purple. These shades seem to offer the greatest attraction to small insects.

To the close observer the desert reveals also a large number of interesting animals. Birds, chipmonks, lizards of every description and color may readily be noticed on and off the

(Continued on Page 41)



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Babbling About Brittany

(Continued from Page 34)

days, it gave me a sensation of unreality when I left the hotel on my first morning and saw these flocks of story book children looking as though they had come down from the wall paper of a modern child's nursery, Little Miss Muffit, Jack Horner, Augustus, Red Riding Hood, Contrary Mary, and all the other delightful unreal children we have ever known.

That is one of the charms of this Brittany, every village has a slightly different aspect, different cap, and different ways. Here is something in petticoats I did not see elsewhere. The grown-ups also wear very bright and embroidered clothes, and a multiplicity of petticoats, one over the other, and each one a different color!! This gives a lovely rainbow effect when they dance, and the skirts switch out, and pink, and blue, and yellow, and red, and green petticoats go swirling round too. It is a great sight on Sunday to watch from below the flight of step the "sortie de la grand'messe" men, women and children all in the velvets and embroidery, and these rainbow petticoats flashing and disappearing as they come down the steps to the road.

The idea behind this petticoat wearing is two fold. Either it is to display wealth, you have money enough to own all these, or to indicate coquettishness, and the difference in color is to make the counting of the number easy. I noticed one pretty girl with a great display. I counted up to six, but I had difficulty in understanding whether she wished to convey a flirtatious invitation or merely exhibit her financial stability. I could not determine whether she wished to flaunt her wealth or her charms at me. Too faint hearted to "take a chance" and risk a snubbing, I shall never know now—for if ever I return she will be a grand mother.

February is the great marrying month and it is not an uncommon sight to see a dozen couples at the church being married en bloc.

It is a short distance to Le Folgoet where you will find one of the altars built in the open air, on the village green, or in an enclosed garden, and here when the day is fine the great religious ceremonies will be held instead of inside the church. In no place in the whole world are there so many churches as in Brittany, perfectly gorgeous cathedral-like buildings set at times in places where only about four houses are, and so far off the tourist beaten track that they are literally "born to blush unseen" and their architectural beauties can never be properly appreciated. Here in Le Folgoet is a splendid church built in memory of an idiot. I have found more than once that a local saint or venerated person has been a half-wit, or a person having some personal peculiarity for which, feared or despised during life, after death he had become beatified.

This particular idiot named Salaun, lived under a large tree, close to a fountain, spending his time decorating the altar of the Virgin with lilies, and eternally singing: "Ave Maria! Ave Maria!"

This evidently annoyed certain villagers so they "took him for a ride" and left him in the depths of the forest, having previously spread an easily believed rumor that he was possessed by an evil spirit. The Priest finding this out went in search of him, only to find him dead. Bringing him back to the village he caused him to be buried near his tree and fountain, when to the amazement of all a great white lily grew on his grave, which, upon investigation proved to have its roots in his mouth, and more miraculous still, upon the great white cup of the flower, in letters of pure gold, was written, clear to be seen by all, the words which had become so irritating by repetition in life: "Ave Maria."

Crowds would then gather round his grave and retell the story. A new and better church had long seemed desirable to the Priest. Here was an auspicious moment to gather the

funds. So in expiation of their cruel conduct he induced them to build this fine "Notre dame de Folgoet," the name Folgoet is a modern corruption of "Notre Dame de Fou du Bois" ("Our Lady of the Fool in the Woods") and from the eastern outer wall there still gushes the water of his fountain of pure drinking water, and on the right hand side of the porch of the church entrance you will see his statue, with his tree in his hand, an angel perched on his back, and, at his feet, a representation of his spring with fishes swimming in the waters of the pool. And do look at the haughty disdainful supercilious stare he gives every villager who enters that door, as though to say: "Who's looney now?"

Eastman Gray Base

(Continued on Page 15)

way. For many years the Research Laboratories of the Eastman Kodak Company have been experimenting with backings, as a result of which they have evolved a special light gray backing which can be applied to negative film and which, in conjunction with the double coated film, obviates halation completely.

For motion picture work a gray base is now being used as the support for all Eastman Super-sensitive Type Two Panchromatic film. This gray base does not change during processing and so involves no danger of chemical trouble.

It is of importance to note that anti-halation backings have no direct chemical effect upon the emulsion characteristics. However, there is a decided enhancement of photographic quality effected by the avoidance of scattered light from the base side of the film. The removal of scattered light, then, gives the effect of different emulsion characteristics, although this effect is arrived at indirectly and not as an alteration of the emulsion.

From a technical standpoint, the only difference in handling procedure demanded by gray back film is a consideration of the gray base density, which amounts to approximately .20 (63%T) in measured density after developing, fixing, washing, etc. The sensitometric difference is very slight, amounting only to a displacement to the left of the H and D curve, as compared with a similar test on white base. Figure 1 shows for the same emulsion, coated on gray base and white base, the actual sensitometric difference. As a result of this base density an increase of approximately 1 1/2 to 2 printer points is necessary. This difference is very slight and causes no difficulties in laboratory procedure.

A practical example of the value of the anti-halation backing is shown in the two accompanying photographs. Figure 2 shows a scene photographed on a negative emulsion coated on a normal white base. Figure 3 shows the same scene photographed with the same camera under identical conditions on gray base film. The films were developed together in a single solution for the same time. An examination of the prints will tell better than words the effect produced by the gray base anti-halation film.

Actual tests by motion pictures shows a marked improvement in sharpness, highlight detail, and an overall enhanced photographic quality. The effects of halation are far reaching and the use of a film which destroys these effects should be in immediate demand.

33 Percent of Gross Now From Foreign Field

FOREIGN accounts now make up 33 percent of Fox's gross film rentals, says Harley L. Clarke in the company's annual report. Increase in number of wired houses abroad promises a continued expansion of this market, said Clarke.



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New B. & H. Printer

(Continued from Page 28)

The machine cannot function if any of its parts are not in perfect order. The accidental "burning out" of a lamp, breakage of film, or any error in threading will lock the machine or stop it automatically, if the accident occurs while the machine is operating.

The automatic functioning of the machine, including the positive and instantaneous change of printing light, insures elimination of waste, a fact which will be appreciated by laboratory experts.

The film "light changes travelling mattes" are prepared before hand and kept in stock for any length desired. An attachment which fits the Bell & Howell splicing machine has been developed which enables the operator automatically to match the film mattes for the length of each scene of the negative with utmost ease and certainty.

The new Bell & Howell printer introduces many new conceptions of printing practice and leads the way to a standardization of printing quality which will be appreciated not only by producers and technicians of the Motion Picture Industry, but also by the public at large.

Fast Improvements (Continued from Page 10)

ing face and skin texture more natural, particularly in close-ups, the use of "Daylight" blue globes in part of the floor lamps was effective. They whiten the light somewhat and make the use of the extra dark make-up unnecessary. At the present time the soft glass of these blue globes does not stand up under studio use as they bulge and burst with continued burning in the enclosed lamp housings used on the set. This has prevented their more general use, and it is hoped the glass and lamp manufacturers will discover a better way to make this product.

While the emulsions have been improved in many ways, still there was an untrue rendering of extremely bright high-lights and deep shadows. Brilliant light sources became blurred by halation to the extent of losing definition. White starched shirts, for example, became dazzlingly white on the screen unless they have been dyed a soft tint to prevent the excessive halation. Light fixtures were stippled or diffused, and highly reflective objects such as beveled mirrors, automobile wind shields, cap visors and such has to be putty-ied down to prevent distracting flare. This fault became even more apparent with the super-sensitive film, so the manufacturers next set about to overcome this. The resultant latest offering is the Super-Sensitive Anti-Halation Film, or, as studio parlance has so soon named it "Greyback" film. The latter name is derived from the appearance of the film, for the super-sensitive emulsion is coated upon a celluloid base that contains a small amount of lavender-grey dye. This dye has the property of absorbing the light that has traversed the emulsion at those portions where the image of an extremely bright object is focused upon it. The light would ordinarily reflect from the surface of the celluloid support, back into the emulsion and further diffuse, causing a halo or flare of light in the area surrounding the bright spots.

Scenes and tests that have been made with the Anti-Halation film are amazing. No longer are we afraid to shoot into the bare filaments of an ordinary light bulb, and the night-mare of the extreme contrast of formal clothes is gone. Cutglass and diamonds are not blocked up with halation, and photograph like the real thing instead of the 5 and 10 cent store variety. Bright lustre paints of settings will now be possible. Silhouettes against the sun or reflections of water do not have the unnatural flare that destroys definition, and light effects take on a new scope of possibility.

The accompanying illustrations show the remarkable advantage of the anti-halation film. The regular supersensitive stock was used, then the "grey-back." Enlargements were made from that portion of the scene where the actor is directly in front of the bright lantern. The old film shows considerable halo of the bright light, and the features of the man are blurred. The anti-halation renders more natural definition, in this respect. It is admitted that this is an extreme example, but the results of ordinary light conditions are so much superior to the old film that this new type of film is now being used on several productions and will soon, I believe, be used exclusively. Both the Eastman and the Dupont film companies are to be congratulated on their accomplishment.

In laboratory practice the slight increase of the density of the negative, due to the dye in the base, is corrected in printing, being about 2 points increase in printing time. No correction was made in preparing the prints for the illustrations shown, and they convey an idea of the slight difference of density of the two films. On the screen the new film gives the effect of being softer in quality, having more detail in the shadows. This is partly due, perhaps, to the fact that the scene may be printed a bit lighter because there are no glaring highlights to try to print down. While this film corrects flare and diffused images of highlights, still this effect is quite different than that diffusion obtained with "Diffusion discs and screens," so that these may be employed as before.

Camera Studies

(Continued from Page 37)

beaten paths, while the coyotes and other larger animals hide during the daytime, but try to keep one awake at night.

High volcanic peaks and jagged rock formations, displaying various tints of red, brown, and purple, surround the lower plains of this desert country and create the impression that one is in the crater of an enormous extinct volcano. Dry river beds cut deep into the surface, and in the distance the wide, but shallow Salt River rushes its swift waters towards the West. There are several extensive lakes hidden in these mountains. Their placid indigo-blue waters reflect a perfect image of the surrounding landscape and the everchanging sky above.

Whoever thinks that only a blue heaven and fleecy white clouds can be found in Arizona at this time of the year, is mistaken. True enough, it is often real hot in the desert under the merciless sun rays, but before the day is over an entire change may have taken place. The sun may be wholly obscured by heavy clouds during the afternoon, only to burst through them again at the end of the day into one of the most gorgeous and colorful sunsets you ever saw.

One never knows what the weather has in store out here. The next morning may not reveal a single cloud, but towards noon the sky is already covered with them, leaving big patches of blue in between. Then, while you are waiting for a sunset, the clouds get heavier and menacing. Suddenly a flash of lightning, a warning from the Gods to men and beasts to seek shelter; and before the thunder-noise has ceased hail stones begin to fall all around, only to be followed a few minutes later by rain drops of equally enormous size.

Wet to the skin we hurried with our cameras to the camp from which we emerged an hour later again on our quest for the majestic fadeout of the setting sun. However, thunder storms were raging all around us, and lightning was flashing in all directions. A beautiful spectacle which lasted for hours!

The sunset was drawing close but drowned totally in the rainswalls on the western horizon. There we could see the rain pouring from the sky. Flash after flash split the approaching clouds. We counted at least a dozen separate storms along the surrounding mountains. From all sides they seemed to rush in on us. We tried to catch the chain-lightnings (as they went down) in our cameras. Nearer and nearer they came till the flash and the thunder appeared to be simultaneous. The first drops fell and urged us to leave the mesa for our safer camping ground. None too soon we arrived there; just in time to save our film and belongings from the deluge by the cloudburst. The downpour lasted several hours, and cooled off the atmosphere and refreshed the soil!

Brighter than ever the sun rose the next morning, brighter looked the earth; and the pure air filled with fragrance from the desert plants was a tonic for the system and a revelation of nature.

Filmo Topics

AMATEUR movie makers will find much of interest in the July issue of Bell & Howell's interesting little magazine, *Filmo Topics*. This will be mailed free if you write to the Bell & Howell Company, 1843 Larchmont Ave., Chicago.

The contents for July follow:

On the Tyranny of One's Elders—The story of an infant's revenge.

Plots for Child Movies—Some ideas which will help you turn out films of the youngsters which everyone will enjoy.

When, Why, and How to Use Color Filters.

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New British 3-Color Process

A NEW British three-color process, known as the Spicer-Dufay system, was demonstrated recently at the Royal Society headquarters in London. Pictures taken by this process may be photographed in the ordinary way, without special apparatus, and projected over all standard equipments, it is claimed. Cost of the color film, it is said, will be slightly higher than black and white.

GOERZ

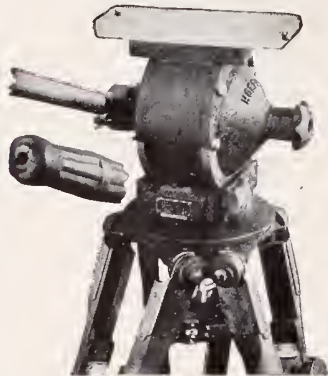
In the manufacture of Goerz Cine Lenses, conscientious and intelligent application is displayed in each successive process—from the careful selection of the optical glass used to the last ultimate polish and adjustments of the lens elements.



A new catalog (AC6) listing the complete line of Goerz Lenses and accessories will be mailed on request.

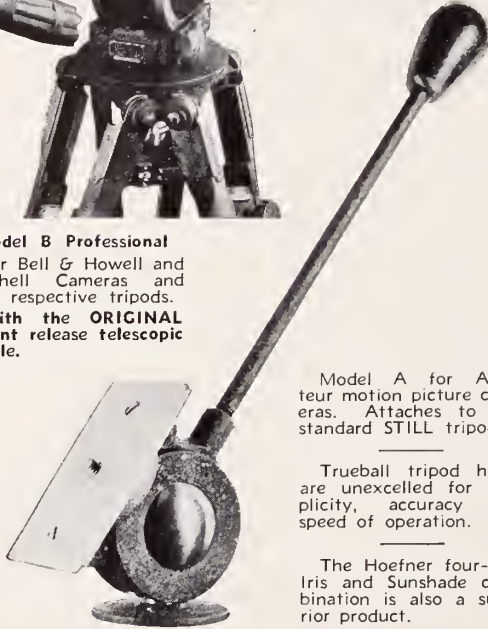
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The Leica Invades the Studios

(Continued from Page 16)

the actual filming of the scenes. It is noiseless and does not interfere with the sound, nor with the cameramen and director. Thus unusual action stills may be secured with a depth and a brilliance as never before. They will boost the sale of the picture to the exhibitor. Hundreds of stills may be taken and the best ones selected for reproduction. The enlargements of Leica negatives up to 8x10 or larger without showing of the grain is made possible through the use of a borax developer for the duplicating positive as well as for the enlarged negative. Such a developer is now generally found in the modern laboratory.

Besides the saving of time, lights, production cost, overhead, etc., the actual elimination of the 8x10 still plates is a negligible item. It is up to the individual stillman to take advantage of the possibilities which the Leica camera offers: Camera angles, situations, fast action, better close-ups which cannot be duplicated, valuable publicity stills, etc. He should be the first one to overcome the old traditions of the direct contact negative and should make suggestions to the studio officials and convince them of the superior results obtainable with the small cameras.

On location the Leica camera with a wide-angle lens is ideal for pictorial work; in fact it is suitable for almost anybody who has real interest in the art of photography. Many of the best pictorials and portraits now exhibited at the photographic salons all over the world have been made with the small cameras.

And the motion picture cameraman is not excluded. Many have already made the Leica part of their standard equipment. For experimental purposes it is unsurpassed, because it allows the cameraman to duplicate the actual shooting conditions. Locations may be photographed with it in advance with the same film, the same filters, etc., as used later on with the motion picture camera. The Leica keeps the cameraman up to date with the rapid changes in the film industry. It serves as an accurate and inexpensive means of testing new film emulsions, filters, combinations, diffusion disks, and gives at the same time a novel and pleasant angle to the photographic work. The whole camera outfit, as well as the enlarger, are so compact that they hardly take up any space in the home or garage.

During the past two or three years the world has become quite color minded. The three or four color processes using separation negatives may be handled with the Leica camera. However, this will not be of as much value to the color cameraman, as the fact that he may obtain accurate data and comparative tests with this camera for emulsions and filters now in use with various color concerns in the industry.

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THE AMERICAN CINEMATOGRAPHER

attention

The pictorial section of the next volume of the Cinematographic Annual is being compiled. Anyone wishing to contribute prints for this section may send them in now for consideration.

Supersensitive Film for 16 mm.

(Continued from Page 36)

"One of the largest fields of picture activities opened by the new 'pan' film is that of indoor sports—basketball games played in well lighted gymnasiums, indoor track events. Other athletic events taking place on well lighted platforms can be easily photographed when stop f.1.9 is used. If the illumination is exceptionally good, even smaller lens openings can be employed.

"The increased range of picture taking provided by the new supersensitive panchromatic film actually embraces night scenes on brilliantly lighted streets, or theatre districts in large cities. For pictures of this kind the camera must be fitted with an f.1.9 lens and the largest stop (f.1.9) must be used. Best results will be obtained after a rain. The glazed surfaces of the street and the sidewalks will then reflect the rays of the hundreds of lights, giving added illumination and unusual effects. If the lights are very brilliant, the camera can be used at normal speed. Half-speed gives twice the exposure and generally produces more brilliant pictures. It should be kept in mind, however, that the action of moving vehicles and people walking on the sidewalks will be twice as fast. That is not so objectionable in the case of automobiles or street cars, because they then only appear to move more rapidly, but the action of people walking will be jerky.

"Animated electric signs usually make fascinating pictures. Action often found in the windows of large stores sometimes affords an attractive night subject.

"Fireworks, flood-lighted buildings, camp fire scenes, are all now within the scope of night movie making.

"The remarkable qualities of Cine-Kodak supersensitive panchromatic film are valuable for daylight photography as well as for pictures at night. The increased light-sensitivity of the film is not confined altogether to the red end of the spectrum. It is nearly twice as fast to blue and ultra-violet light as regular panchromatic film, permitting successful pictures to be made under very adverse weather conditions. Unique shots can be made during a downpour of rain with supersensitive film, and the cine camera now becomes an efficient instrument during the early hours of the morning or in the weak light of the afternoon.

"Cine-Kodak supersensitive safety film makes the 'photographic day' twenty-four hours long."

Television to Spend \$250,000,000 On Output


CONFIDENT that general business conditions will improve soon, production plans have been made for \$250,000,000 worth of television broadcast sound receivers and accessories, said B. P. Geddes, executive vice-president of the Radio Manufacturers' Ass'n, at the convention held in Chicago recently.

Issues Lighting Catalogue

A 100-page catalogue on electrical lighting equipment for theatres, giving complete specifications with illustrations in colors, has been issued by the Major Equipment Co., Chicago. Reflectors for all uses, stage lighting products, both permanent and portable, window lighting, flood lighting and cove lighting are among the subjects treated.

Stills From Action Scenes Possible With New Camera

A NUMBER of Hollywood studios are now using a new type still camera which makes pictures from action scenes. Backers of the project are said to include Mervyn LeRoy, Louis J. Selznick, John McCormick and William K. Howard. The camera is also being sold on a royalty basis to photographers outside of the film industry.

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Scientific and Practical
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New Splicing System for Sound Track

AN improved system of treating the sound track at splices—a system eliminating messy methods of painting and at the same time successfully silencing splice noise—has come out of the Eastman Kodak Research Laboratories and onto the market. The new method was described to the industry more than a year ago, but production of the necessary “bloopers patches” and the simple block for applying them has only recently made it applicable in processing laboratories and projection rooms.

The introduction of this equipment came as a result of many requests that followed the announcement of the new patching process. The wide interest shown indicated to the Kodak Company that expenditures involved in acquiring tools to make the patchers and the patches would be justified.

The patching system obviates a condition in which imperfect painting of the sound track at splices frequently caused noises as objectionable as the extraneous sounds made by the reproducing system when an untreated patch went through. The older method caused more dissatisfaction in projection rooms than in laboratories, where skilled workers painting the sound track at hundreds of splices a day attained proficiency in the process. Even in the laboratories, however, it is believed that greater speed, together with assured accuracy, can be gained by use of the new patching process.

In seeking a solution to the problem, the Eastman Kodak Research Laboratories first tried gummed paper, then decalomania transfers, and then an opaque film material; but none of these materials for patches proved entirely satisfactory.



An Example of the New Patch

The material finally adopted was a very thin clear film base, coated with an emulsion and exposed and developed to produce opacity. The patches are five perforations long and they are cut in a shape designed to cover the sound track completely for a distance equal to the width of a standard splice but tapering away toward each extremity until the sound track is entirely exposed. When a properly mounted patch passes through the reproducer the light reaching the photo-electric cell from the sound record is reduced gradually to an insignificant intensity and so continues until the splice has passed, after which the light passing through the sound record gradually attains its original intensity. The resulting diminution of sound lasts not long enough to be perceptible.

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Hold It!

President McNabb of the Bell & Howell Company makes personal movies of the captain of the Leviathan as he leaves on a European trip. Of course, it is a Film.

Industrial Color Rights Acquired by M. P. Machines

EXCLUSIVE industrial color rights to the Panachrome color process for the U. S. and Canada have been acquired by Motion Picture Machines Co. of Pittsburgh, it is announced by A. S. Isaacs of the latter company. Panachrome is a four-color additive method, requiring a change of a lens in the camera and in the projector. The stock is regular black and white film and can be processed in any laboratory in the usual way. Any camera and any projector may be used with no more trouble than is required in changing from one focal length lens to another in either camera or projector, it is stated.

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Hollywood, California

Amateur Movie Making

(Continued from Page 30)

dramatize the holiday so that the film will be of lasting interest to all of the participants? If you follow the first two methods, you can safely follow the news-man's method, and shoot things as they happen. If you prefer the latter type of picture, you will have to stage most of the action. For this, you will want some prearranged plan: not necessarily a script, but at least some notes on what to get, leaving the actual method to your ingenuity at the moment.

If on the other hand, you do not care for the record film, but want to make a real dramatic picture, you will want a definite, carefully prepared script. In it you will not only indicate what scenes are to be shot, but just how they are to be photographed and directed, in considerable detail. Furthermore, if you attempt serious dramatic filming, you must make it a collective proposition; you positively cannot attempt to do it all yourself. You must have the enthusiastic cooperation of a group, some of whom will act, some of whom will assist in costuming, set-building, location-picking, property-handling, transportation, scenario-writing, script-clerking, and all the many other details which must be perfectly attended to. Most important of all, you should have someone who will take the responsibilities of directing the action off your shoulders, for if you are to photograph the picture properly, you cannot attempt to carry two jobs on one pair of shoulders. But with such a group, with the responsibilities properly divided, you can have more pleasure, and gain more valuable experience than you could in months of independent filming. Try it!

Thirty New Theatres Underway in Scotland

A SURVEY of theatre building activity in Scotland shows that between 25 and 30 houses are in the course of construction, and a number of others scheduled.

The Stirling territory tops the list for building progress with three houses of 2,000 or more seating capacity planned. Supers of approximately 2,000 seats are to be built in Stranraer, Burnside, Aberdeen and Peterhead.

The new Paramount, on which work is expected to be launched in Glasgow shortly will accommodate 3,000, and three additional large houses are programmed for Gallowgate, Riddrie and Cumbernauld Road, also in Glasgow.

Fast Camera Demonstrated

A NEW motion picture camera which permits the photographing of phenomena which last only 1-100,000th of a second has been demonstrated to the French Academy of Science by two French inventors, M. Labarthe and A. L. Seguin.

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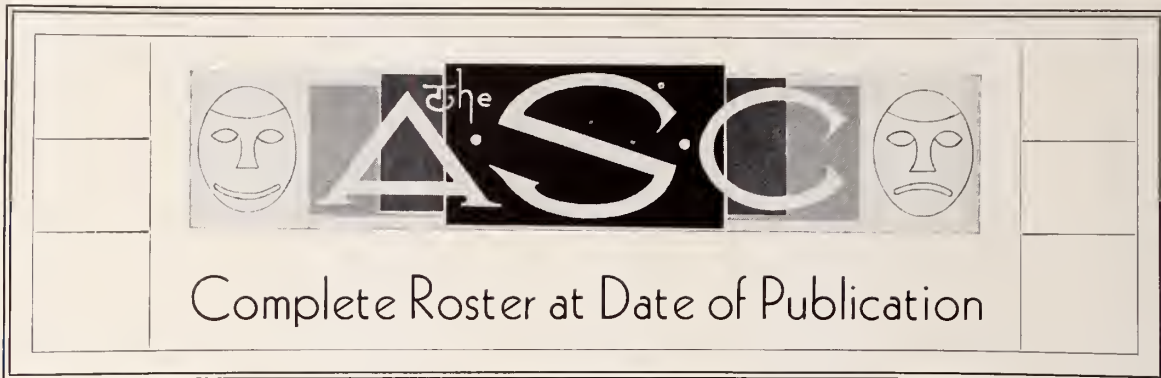
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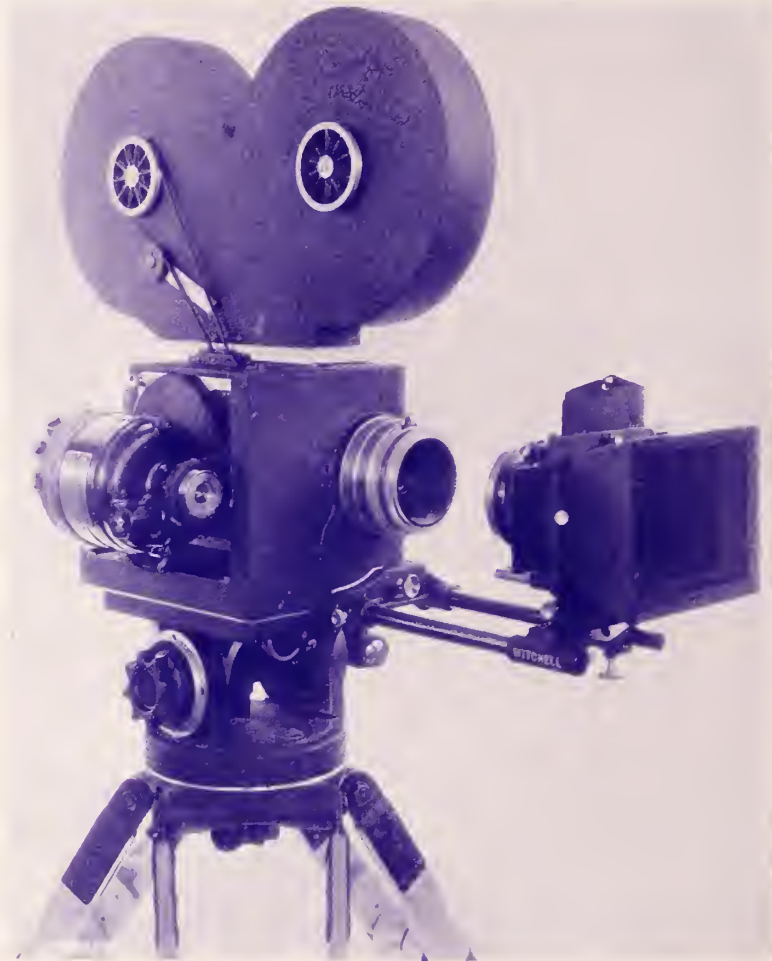
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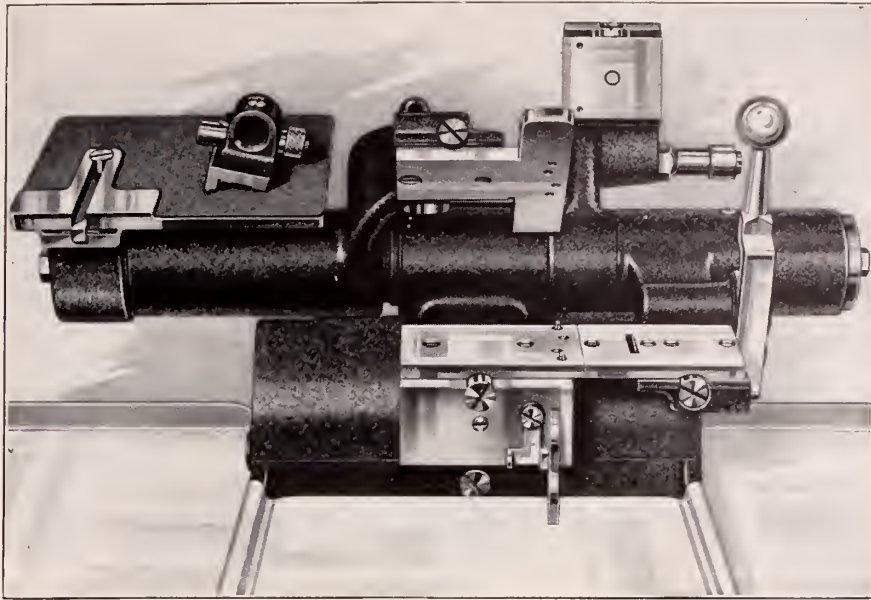
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Volume XII

AUGUST, 1931

Number 4

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- ¶ Cinema Studio Supply Corporation placed orders for 15 36", 150 24" and 100 18" LACO Sun Spots, 54 advanced type LACO Smooth Lites, 52 LACO Rifle Spots, 25 LACO Strip Lites, 11 LACO Location Boards and 1000 LACO Spill Lite Controls.
- ¶ Ralph Like purchased two LACO improved Carbon Break boards and 10 LACO Rifle Spots.
- ¶ Orders were received from Radio Pictures Corporation for eight LACO Carbon Break location boards.
- ¶ United Artists studios purchased 25 24" LACO Sun Spots, 10 LACO Rifle Spots, one LACO Remote Control board and two LACO Manual Carbon Break boards.

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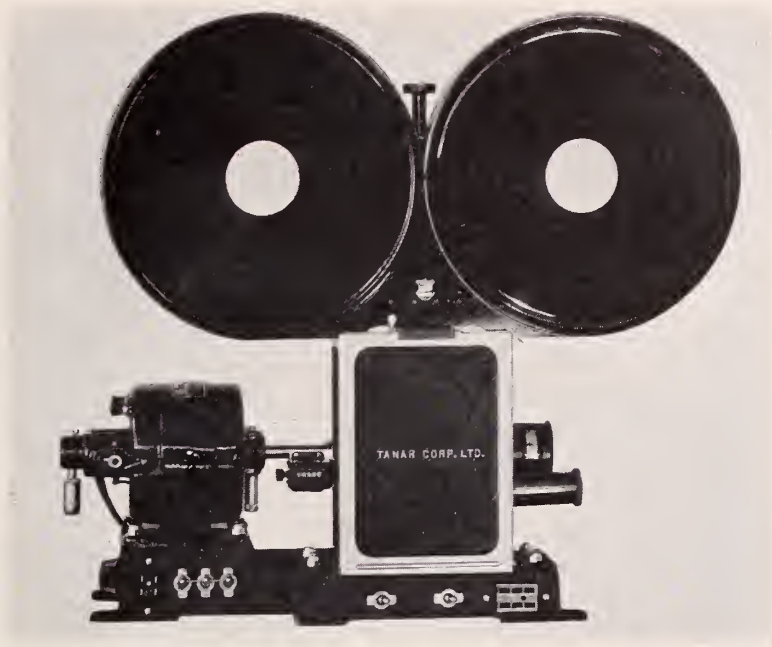
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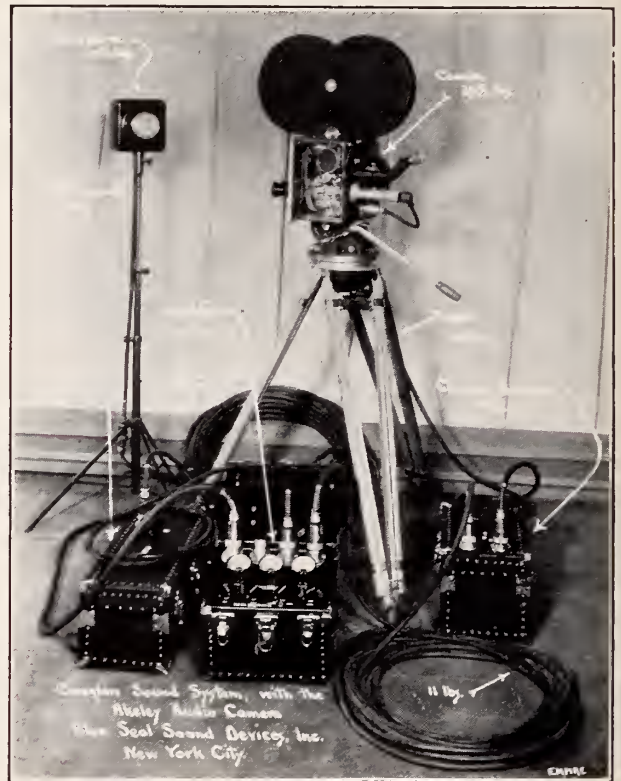
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Top, L. to R.—Elephants as camera-platforms. Doug meets Aguinaldo. Doug bags his first leopard.

Second row—Henry and some Hindu friends. The Royal Siamese Ballet performs for us. Henry, Doug, and Vic on the Agra Golf-links.

Center, left—Vic and Henry at the Taj Mahal. Right—Doug visits Angkor Vat on elephant-back. Middle, above: Vic and some Chinese beauties; Doug and Mei Lan Fang's family. Below: Vic, Duke Kahanamoku, Dick Arlen, and Doug are welcomed to Honolulu; Doug and some young Siamese admirers.

Fourth row: Doug poses for the amateur photographers; Doug and Vic discuss pictures with a Chinese cinematographer; Lunch-time on the Tiger-shoot.

Bottom: R. and L., The Ghats along the sacred Ganges at Benares; center: Henry and an aged Chinese beggar.

Four Musketeers . . . and a Camera

by **HENRY SHARP, A. S. C.**

HELLO, HENRY—this is Doug Fairbanks. I'm going around the world; want to come along, and bring your camera with you?" This surprising statement greeted me when I answered the strident ringing of my telephone one morning last winter. While I struggled to recover from my surprise, Doug's voice kept on tempting me with glowing phrases about the glamour of the East—of Royal elephant hunts in Siam—of tiger-shoots in India. . . .

Business, family ties, and everything conspired to hold me here in Hollywood; but there was no denying Doug. He was determined that I should come with him, so come I must. Every obstacle that I or chance threw in his way, his tremendous enthusiasm abolished, so finally when he boarded the S.S. "Belgenland" to start the first lap of his trip, I was with him—and quite as enthusiastic as he.

Four months and one week later I returned to Hollywood, after one of the most strenuous and delightful experiences of my life. The close companionship of such a voyage has a way of revealing the true character of a companion as nothing else will; travelling with some people is an ordeal—but travelling with Doug proved to be a joyous adventure. No matter what were our surroundings—whether they were the palaces of the various kings and rajahs that entertained us, or the sultry discomforts of a jungle hunting-camp—Doug was always the same, cheerful companion, enjoying himself so hugely that the rest of us could not help enjoying ourselves, too.

Our party consisted of Doug, himself, Victor Fleming, "Chuck" Lewis (Doug's trainer and pal), and myself. Here and there we met kindred spirits who would join the party for a few days or weeks, but our party proper consisted of this quartette—the Four Musketeers, as Doug called us, looking for new worlds to conquer, and finding new adventures everywhere. Our route took us across the Pacific to Japan, then to China and the Philippines, then to Cambodia and Siam, where we were literally Royally entertained, being the guests of H. M. King Prajadhipok, across to India, where we were again Royally entertained both by the many native princes and (in a quite different way), by My Lord, the Tiger. From India we reluctantly turned our steps to Europe, where, in Paris, we separated, Vic and I to return to Hollywood and the prosaic realities of picture-making in Hollywood, and Doug and Chuck to Scotland and—golf.

We had many wonderful experiences to look back on, but our reminiscences were by no means all in memory, for we brought back with us more than 30,000 feet of film which we had taken on the way. This film was photographed primarily for our own pleasure, but since our return it has proven so interesting, not only to ourselves, but to the various friends and associates whom Doug has invited to see the "rushes" as the shipments straggled in, that it may possibly be generally released.

Our photographic equipment consisted of my Studio camera, which was fitted with a Tanar portable recording system, and two Eyemos. The Eyemos were a revelation to me, for I had had little confidence in the performance of such hand-cameras; to my surprise, they not only performed perfectly, and gave exceptionally fine photographic results, but they proved themselves quite indispensable for this sort of work. There are hundreds of the most interesting scenes which we could never have made, had we not had these dependable, unobtrusive little instruments. We were likewise fortunate in the photographic talent we had available, for Vic Fleming, before he started directing, was an outstanding cinematog-

rapher himself. So both of the Eyemos were kept busy. Another surprise was the skill that I acquired in the course of our journey as a sound engineer. Before leaving Hollywood I had had no more experience at actual sound recording than any other cameraman might naturally acquire in the course of photographing talking pictures. I knew, of course, the rudiments of recording practice, but as I had always been busy enough to make me glad to leave the details of recording strictly to the sound engineers on the set, it was with some trepidation that I undertook the recording of the various scenes which we made in sound. I shouldn't have recognized a decibel or a piece of sound perspective if it had come up



Henry Sharp, A. S. C.

and bitten me! But the experience I had on the trip as sound-man-and-cinematographer has made me feel quite like a recording expert. I shouldn't flatter myself, though, for without doubt most of the credit for the good recordings we made should really go to the simplicity of the Tanar recorder we used. I doubt if I could have made a mistake with it, if I had wanted to. That outfit gave me one lasting regret, though, for all the way across the Pacific I spent most of my time studying the instructions and blueprints that Len Roos gave me, and by the time that we were ready to shoot, I felt myself quite an expert sound "trouble-shooter"—but the darned thing obstinately refused to give me any trouble to shoot!

Aside from my inexperience as a recordist, the only technical worry I had on my mind was the effects that the tropical climates we passed through and worked in might have on the film. I had never worked in the tropics before, and the heart-rending tales that my friends who had done so primed me with had by no means tended to cheer me up. I took every possible precaution, however, never leaving the film in the magazines any longer than was absolutely necessary, and then immediately sealing it up in the cans, with plenty of the good, old calcium chloride to absorb the moisture. As a result, we did not lose a foot of film from this trouble, although we shot thousands of feet in the Philippines, Siam, Cambodia, and India. The laboratory work was all done in Hollywood, which is a plan that I can heartily recommend to all my fellow-travellers, for, with rare exceptions, both the cine and still labora-

(Continued on Page 21)

The Mercury Arc as a Source of Intermittent Light

by **HAROLD E. EDGERTON**

Massachusetts Institute of Technology

MOTION pictures are ordinarily taken by means of a mechanical mechanism that stops the film intermittently on each frame and then opens a shutter. The shutter can be eliminated if the light is intermittent and in phase with the film so that the light is on only when the film is stopped. With a light of very short duration but of high intensity it is possible to run the film at continuous speed, the limitation being that the film must not move an appreciable distance while the light is on. Framing by this method is accomplished by flashing the light at time intervals determined by the speed of the film so that the pictures do not overlap and are not spaced too far apart.

Another application of intermittent light for motion pictures is the possibility of taking slow-motion pictures of rapidly moving machines or mechanisms. This is conveniently done by arranging the frequency of the light so that it differs slightly from the frequency of the mechanism. For each exposure the mechanism will have gone through its entire sequence of events plus an increment. The apparent motion of the projected mechanism is then at a frequency which is the difference between the light and mechanism frequencies.

Practical difficulties and physical limitations in the past have imposed restrictions on the production of flashing intermittent light by ordinary methods. Neither the incandescent

nor the carbon arc can be induced to give intense light flashes of short duration since their illumination depends upon the temperature of a filament or an arc. Both of these lamps can only change their illumination qualities slowly because of the heat capacity of the incandescent parts. The efficiency of an alternative arrangement using a shutter or a rotating disk with slots is poor since the light needs to be operated at full brilliancy all the time. There are also mechanical limitations upon the speed of the shutter or the disk due to vibration and stresses.

Light sources that obtain their illumination qualities from electrical discharges in gases, such as neon or mercury, have practically no time lag when turned on or off. The neon tube, because of this property, has been used for television and for stroboscopic observations. However, the light from the neon discharge is mainly red and is not very effective for photographic uses. Intense sparks in air have been used successfully for rapid photography but the auxiliary apparatus is generally bulky because of the necessary high voltage and, moreover, the control of the discharges is difficult.

The familiar mercury-arc lamp, slightly modified, can quite readily become an intense source of intermittent light if connected to the proper electrical circuits. The light from the mercury-arc consists mainly of strong violet and blue colors which are very actinic.* One of the remarkable properties of this type of light is that it can be made to give a flash in less than ten microseconds. Another is that the instantaneous intensity is a great many times that of the normal rating of the tube so that the average light compares with that of continuous operation. A fourth property is that the time between the flashes is easily controlled by means of a grid. These characteristics give the mercury-arc thyatron some interesting possibilities as a practical intermittent light source. "Thyatron" is the name that has been given by the General Electric Co. to gas-filled arc discharge tubes that have control grids.

The elements of an intermittent mercury-arc thyatron light source are sketched in Fig. 1 together with a plot of the variation of light against time. The condenser, C, builds up a charge through the resistance, R, from a d-c. supply while the grid is negative with respect to the cathode. At the moment the switching arrangement, S, makes the grid positive the anode begins to conduct and the tube practically acts as a short circuit to the condenser. The time for this discharge is determined by the characteristics of the thyatron and also by the resistance and inductance of the wires that connect the condenser to the tube. From a practical standpoint the time for the discharge is negligible for most purposes. When the switch, S, opens, the grid gains control and the condenser accumulates a charge for the next flash. The time between flashes, marked T on Fig. 1, is determined entirely by the speed or frequency of the switching or tripping arrangement and is adjustable over rather wide limits. The switching arrangement may be either a mechanical make-and-break or a source of alternating voltage such as a vacuum tube oscillator.

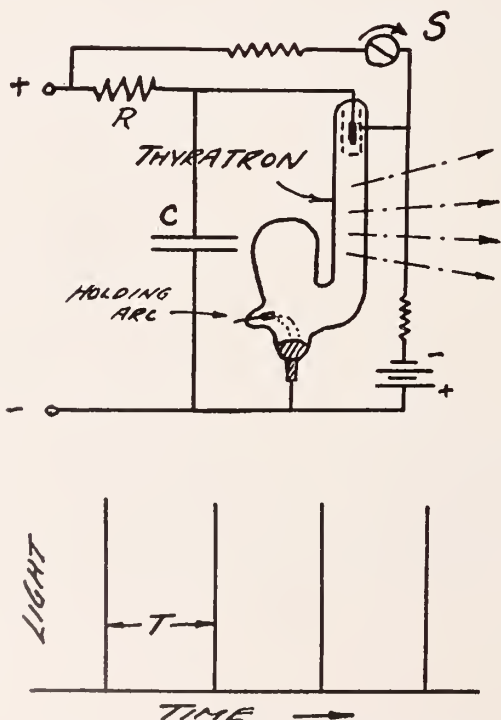


Fig. 1. Electrical circuit which affords a source of intense intermittent light of high actinic value. The lower figure shows how the light intensity varies with the time.

* A spectroscopic study of the time distribution of the radiation by means of Professor D. C. Stockbarger's synchronously rotating drum spectrograph (described in the Review of Scientific Instruments, April, 1930) shows that the majority of the actinic light is between 3660 and 4348 Å for the flash.

Stroboscopic Motion Pictures of Synchronous Machines

The particular problem to which the use of flashing intermittent light has been successfully applied is the stroboscopic photography of the angular displacement of a synchronous motor. Motion pictures of the rotor were taken while a motor pulled into synchronism after having been started as an induction motor.

The rotor of a running synchronous motor, when observed with intermittent light of the same frequency as the alternating current which drives the motor, appears to be stationary, since the poles are in exactly the same position when the flash of light occurs. However, when the load on a synchronous motor is changed the poles must drop back in phase to supply the required torque and this angular shift is observed when the rotor is illuminated by means of stroboscopic light. The rotor usually oscillates about its final steady operating angular position, eventually stopping there.

Observations of such motional transients of synchronous machines have been made by means of neon stroboscopes but accurate readings of the position of the rotor cannot be made

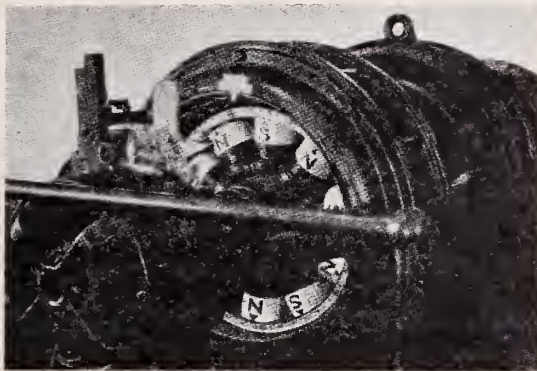


Fig. 2. Photograph of a large synchronous motor arranged with a thyratron source of intense stroboscopic light for taking motion pictures of the angular transients of the rotor.

when the rotor is rapidly changing its position. The intense intermittent light of the mercury-arc thyratron tube that has been described has made it possible to take such readings by means of motion pictures.

Fig. 2 shows a synchronous motor together with a thyratron tube so that stroboscopic motion pictures can be taken. The poles are surrounded with white cardboard in order to be photographed more easily. This motor rotates at 720 rpm, and its rotor is about four feet in diameter, so that the periphery is traveling at a speed of about 9000 feet per minute or approximately 100 miles per hour. The camera is placed about three feet from and perpendicular to the rotating periphery. For a satisfactory photograph the rotor must not move more than 0.02 inch for the exposure. Knowing the velocity of the rotor, it is possible to calculate the necessary duration of the light thus:

$$0.02 \div \frac{9000 \times 12}{60} = 11 \times 10^{-6} \text{ seconds}$$

or about 10 microseconds. If the film is to be properly exposed in this short time the mercury-arc tube must produce a powerful light. As a very approximate calculation consider that a 50-watt incandescent lamp would give an equivalent exposure if placed in the same position while operating continuously. The stroboscopic illumination necessary in ten

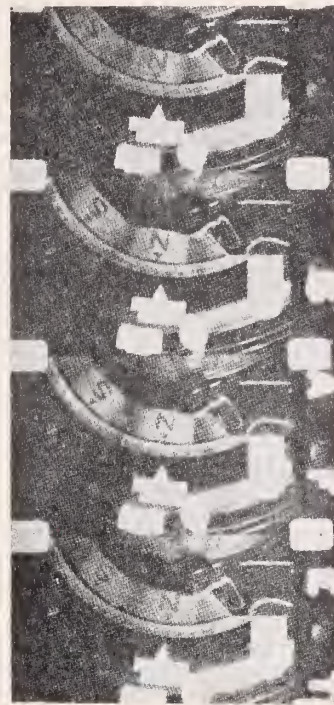


Fig. 3. Four enlarged 16 mm. motion picture frames taken while the motor was running. A change in the phase of the pole is noticeable between frames.

microseconds to give the same average light is that of an 83,000-watt lamp. For this calculation the frequency of the light flashes has been taken to be sixty times per second.

The switching arrangement for these stroboscopic tests was a transformer connected to the stator. The secondary voltage of the transformer was made sufficiently high so that the discharges were regularly timed.

The ideal way to take motion pictures by means of intermittent light is to synchronize the light and the camera so that the flash of light occurs when the shutter is open. Such an arrangement requires for this problem a camera driven by a synchronous motor at 60 frames per second. However, it is possible to take satisfactory pictures at 16 frames per second and depend upon the random coincidence of an open shutter and a light flash to occur at the same time. Actually the shutter for this case is open about 0.033 second and during this time the light will flash once or possibly twice. Since the angular period of the synchronous motor is slow, about one cycle per second, a double exposure on one frame shows the pole in practically the same position for both. The double exposure does not result in enough difference in density to cause any appreciable effect upon the projected pictures.

Four enlarged 16 mm. frames are shown in Fig. 3. They were taken on panchromatic film with an Eastman Cine Kodak having a lens speed of $f/1.9$. The synchronous motor was rotating 720 revolutions per second when these were taken and the change in phase of the rotor between successive frames is clearly shown. From the sharpness of the pictures, the exposure must have been less than about ten microseconds. These movies were taken from a 100-foot reel that recorded the pulling-into-step transients of a synchronous motor just as it reached synchronous speed following the starting period. They were used to illustrate a paper upon the pulling-into-step problem that was presented to the American Institute of Electrical Engineers at New York in January, 1931.

Printed Through the Courtesy of the S. M. P. E. Journal



Quadzazet Fort in Morocco. This is the extreme inland outpost of the Foreign Legion



Native dance being staged at Pasha's Palace, Quadzazet, Morocco, for the entertainment of the American picture men.

A Romantic Journey

In Which an A. S. C. Member Visits Three Continents

by **HAL HALL**

IF YOU or I should drop in on a perfect stranger and he should kick his wife out of her private boudoir so we could have it as our resting place, we would think him a hospitable fellow. But—what would you think if the man ousted a whole flock of wives and turned their quarters over to you?

That is just what happened in the Pasha's Palace at Quadzazet, Morocco, when Harry Perry, widely known Hollywood Cinematographer and member of the American Society of Cinematographers, pulled up at said abode in company with Curtis Nagel, Howard Brown and Claude Flemming after a long, hot journey over burning desert sands. The Pasha only had four wives in his harem, but he quickly ousted them and installed the four American strangers therein to sleep upon their downy beds amid the delicate perfumes and incense drenched quarters that are usually "tabu" to all but the head man of the family in a country where said head man's limit of wives is governed solely by his purse and his desires.

As a further gesture of hospitality the very friendly and hospitable Pasha then called close to three score of his beautiful dancing girls and staged a special dance for the entertainment of his guests, which lasted for seven consecutive hours.

"And what a peculiar dance it was," says Mr. Perry. "During the entire seven hours I don't think that any of the dancers moved over a space of more than two feet. They all lined up in a big circle, with the musicians in the center. Then they started the dance which consisted principally of shifting their weight from one foot to the other in time with the monotonous

thumping of the crude drums of the musicians. Those girls just picked them up and laid them down enough times to have covered miles if they had been walking. With their training, they ought to make marvelous marathon runners.

"But, as for hospitality, you will never find so much as in that country of desert sand and sunshine and fighting natives. Their homes are yours and you cannot stay too long to suit them. One might have thought the girls had danced enough when they finished the night program, but they lined right up again in the morning and staged the dance again so we could photograph it. And it was a colorful picture. I photographed it in natural colors (Multicolor) and it proved to be a gem among the many unusual scenes which we secured on our journey."

Mr. Perry's trip was made for the purpose of photographing four of the series of "Romantic Journeys" which Nagel and Brown are producing for Educational release. Because of the nature of the pictures, only the unusual and out-of-the-way places of the world are pictured, which takes the cameramen into the most delightful spots.

"We spent three months on this trip," said Mr. Perry, "and it was one of the most interesting journeys I have ever made. We landed in Northern Africa where, through the auspices of the French government, every courtesy was extended us. The episode at the Pasha's Palace in which he threw open his harem for us, was typical of our reception throughout the entire country.

(Continued on Page 28)



Left to right: Arab policeman; Curtis F. Nagel; chief of police of Manekesh; Claude Flemming and Harry Perry, photographed at Manekesh, Morocco.



Jack Holt in a scene from "Dirigible," photographed in the famous airship, "Los Angeles"



A view down the "Catwalk" of the "Los Angeles"

Putting the Realism into "Dirigible"

by JOSEPH WALKER, A. S. C.

IN A recent review of the picture "Dirigible," which I photographed, the critic commented that the picture was a shining example of what could be done by the judicious use of stock scenes. While I am, naturally, grateful to the gentleman for the other very nice things which he wrote about the production, I feel that he has been most unjust in making the above-quoted statement, for "Dirigible" was **not** made of stock scenes. With the exception of two scenes (one of the Lakehurst, N. J., railroad station, which had been removed some months before the film was made, and one of a sealing ship in the Antarctic), every scene in the picture was exactly what it represented itself to be. And when a relatively smaller firm, such as the producer of "Dirigible," deliberately assumes the very considerable cost of assuring absolute authenticity in a production where the cheaper stock scenes could "get by," I feel that it is only fair that we of the Industry should give them all possible credit for so doing.

Many of the scenes of this picture centered around the U. S. Naval Air Service, and particularly around the operation of Naval Dirigibles. There is no dearth of stock film of these operations; and had such scenes been used, I am sure that, between intricate cutting, process work, and miniatures, adequate results could have been attained, at a relatively small cost. But Columbia was not out for merely adequate results in "Dirigible," and Samuel Briskin, the studio's general manager, who personally supervised the making of the picture, and who is perhaps more keenly exacting in the matter of getting a full dollar's worth of production for every dollar spent than any other executive in the business, was wise enough to see that an otherwise superlative production would fall very flat if such important scenes were made "merely adequate." Therefore he spared no expense in assuring absolute authenticity in every detail of the production.

Hence, as the readers of this magazine will recall from Elmer G. Dyer's recent article on the making of "Dirigible," Mr. Briskin transplanted the entire production unit from Hollywood to Lakehurst and, accompanying the unit himself, saw to it that neither the Director, Frank Capra, nor I, as cinematographer, were so unduly rushed as to slight any of these important technical and artistic details of the production. It is all too seldom that we get such cooperation from the producer now-days, when the cry is "save here—skimp there—anything to cut costs." So it is no wonder that Mr. Capra and I—and the whole troupe, in fact—were filled with enthusiasm, and strove our hardest to turn out a really great picture.

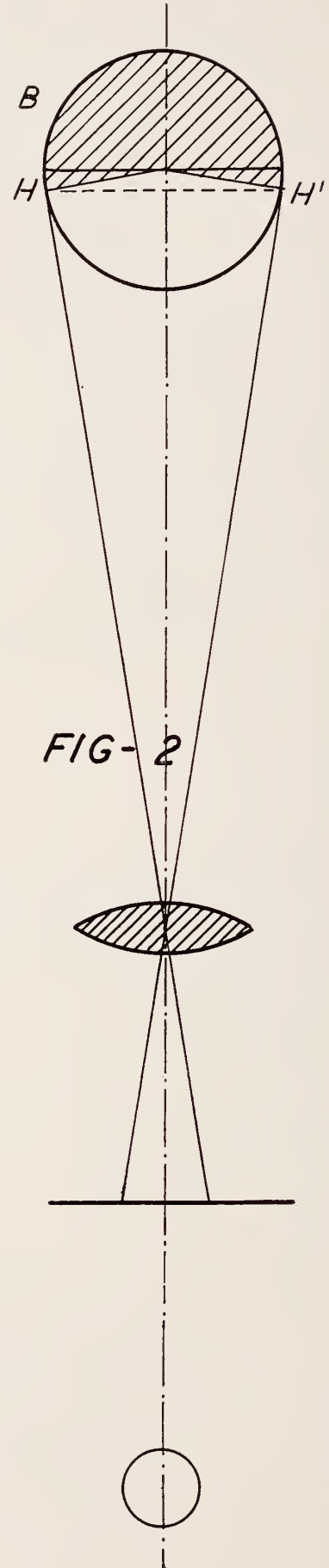
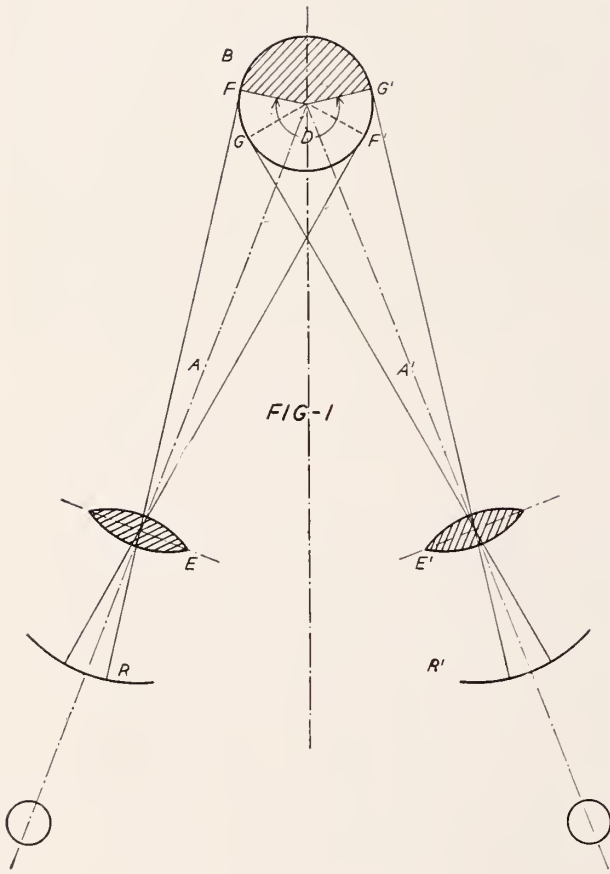
We spent many weeks at Lakehurst, comparatively unhurried, seeking only to get the utmost of accuracy and cinematic effectiveness into our scenes. When we left, I believe that we all felt that we had succeeded. And all during this time, Mr. Briskin, apparently unmindful of the fact that our company overhead was mounting at the rate of more than \$15,000 per day, had insisted, not on rushing through any way, but on getting the best and most accurate scenes possible.

My chief concern at Lakehurst was the photography of the various scenes on the ground, and in the great dirigible "Los Angeles" itself, as Mr. Dyer was in charge of the scenes taken in the air of the big blimp. The ground work, though exacting, was comparatively easy, although working with a large number of cinematographers—Eastern men, with whose individual characteristics and capabilities I was not as perfectly accustomed as I would be with a Hollywood crew—was at times a bit trying. But the work in and from the big blimp was interesting and exacting in the utmost. One sequence in particular

I recall: it required scenes of a Naval airplane attaching itself to a trapeze beneath the "Los Angeles." Mr. Dyer covered the action from a smaller blimp flying alongside, while I and my associates photographed it from the big ship itself. I placed one man with an Akeley in one of the motor-gondolas, an Eyemo on the airplane itself, and then stationed myself to catch close-ups of the contact from just above the trapeze-opening. I had intended, naturally, to use a big studio camera; but when the time came I found that there was no place for so large a camera—so instead I used an Eyemo. I had little enough faith in the small camera, but as I had to cling, spread-eagled among the aluminum frame-girders of the ship's hull, hanging on by one toe and my eyebrows, with nothing but about 6,000 feet of thin air between me and terra firma, I had to be content with the hand-camera, and hope for the best. And, to my surprise, I got the best! In other words, I got one of the most spectacular shots of the picture—a fine close-up of the plane approaching, and making the contact. Incidentally, this bit took flying skill of the highest order, for the plane had to approach the trapeze by a circuitous route, around the stern engine-gondola, and then up to the hook, and (due to the difference in the speeds of 'plane and Zepp), at almost its minimum flying speed, where control was a very difficult matter. And yet that obliging pilot cheerfully did this stunt many times, while we made take after take of the scene.

The scenes which we photographed within the big blimp were most interesting photographically. A Zeppelin, as you may know, is constructed of spidery aluminum girders, covered with doped linen, and containing a large number of smaller gas-bags, or balloonets, of silk, lined with gold-beater's skin. For the most part, the outer covering is doped with an opaque aluminum or silvered pigment, which keeps the light and heat of the sun from the gas-bags; but the lower part of the ship is covered with translucent linen, which is merely plain, white linen tightened to a drum-head tautness with unpigmented dope. This admits a beautifully diffused, soft light, which comes naturally, entirely from below. Here and there observation holes are cut in this lower covering, making a very peculiar lighting combination, of this soft, diffused under-lighting, with here and there "hot spots" directly above the holes. Although this picture was made before the introduction of "Fast Film," there was ample light for good photography, and the results on the screen were beautiful in the extreme. Both Mr. Capra and Mr. Briskin commented upon this point, and when, upon our return to Hollywood, it became necessary to make additional scenes to match up with these taken in the blimp in the air, they were most insistent that I depart from the ordinary studio lightings, and match the original lightings to perfection. That **was** a problem! I experimented with all sorts of silks and jellies on my lights, and finally decided that I must pass my light through unpigmented, doped linen exactly as the light was passed through it in the actual Zepp. This proved difficult to do in the studio, for we built up an exact reproduction (metal girders and all) of a hundred-foot section of the interior and framework of the "Los Angeles." You may think a studio stage is a big place, but you've no idea how it shrinks when you try to stuff a piece—even a small piece—of a huge dirigible into it. Our biggest stage was crowded to the limit to accommodate our set. From my viewpoint, it would have been quite all right had there been enough room to suspend the structure ten or fifteen feet above the floor, so that I could get my lights beneath it: but the struc-

(Continued on Page 20)



Screen Definition

by **DR. L. M. DIETERICH**

Consulting Engineer

THE INSTANTANEOUS flexibility of the human optical system is of a degree of perfection so far not attained by any photographic system or any projection system or any combination of such systems as the following analysis endeavors to show to the lay mind.

When we look at a landscape through a window, for example, and assume that both of our eyes are normal, we find, that in viewing the whole depth of the visual field without special attraction by any part thereof—our sharp sight ranges continuously throughout the field in a three dimensional manner like an ideal television scanning device.

For a given focal distance the eyes range in a rapidly oscillating, extending and contracting spiral, pulsating at the same time throughout the whole depth of the field.

This complicated, practically instantaneous displacement of sharp point-focus can be likened to a spiral watch spring contracting and expanding like the balance spring in a watch. If we can visualize that at the same time the center of such balance is synchronously pulsating along the shaft, forcing such balance into a periodically increasing and decreasing conical shape and if we further try to visualize that the point focus is at the same time travelling along the length of this spiral from the center towards the periphery and vice versa and that this complex oscillatory motion takes place in a fraction of a second—then we get an idea of a part of the amazing optical perfection of the human sight.

This complicated three dimensional rapid spiral scanning, however, includes a synchronous automatic change in the momentary optical characteristics of each eye and an automatic, ever-changing balance between these changes of both eyes.

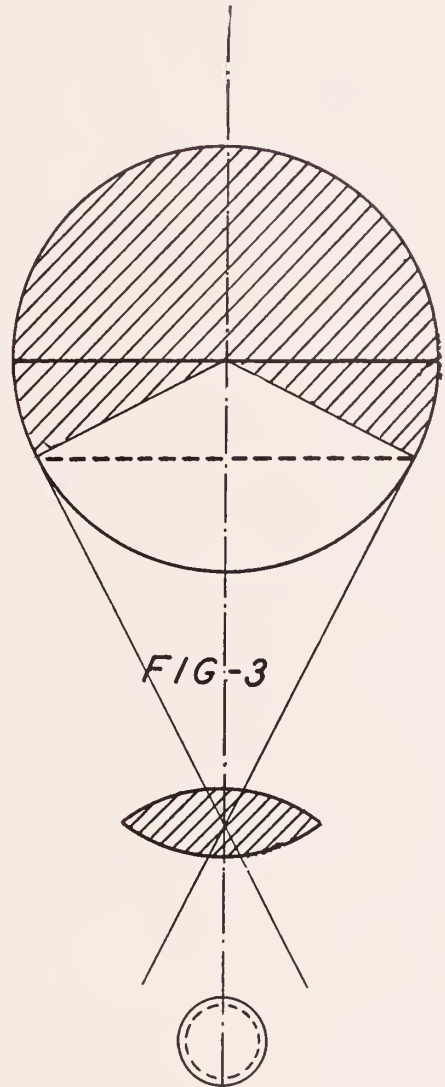
In the above described three dimensional ranging each eye changes in its wandering from point to point in the field, its focal value by so-called accommodation or in physical fact by the unconscious muscular control of flattening or bulging the crystal lens. At the same time the involuntary change of the size of the pupil (lens-aperture) is automatically and instantaneously controlled by the brightness of the point upon which the eye is focused. This modern thesis however holds good only for the comparatively small field or physiological angle surrounding the optical axis of the edge when it is endeavoring to focus on a single point.

These automatic changes of the optical characteristics of the two human eyes occur independently of each other. Their retinal results, however, are blended into one nerve sensation by the again instantaneous and automatic convergence of the optical axes of the eyes, resulting from the involuntary adequate revolving of the eyeballs and resulting in the intersection of the two optical axes at the point of the field under momentary visual observation.

Diagram Fig. 1 shows approximately the optical coordination of both eyes for such a momentary condition of sight.

B is the object point of concentrated sight, for clearness sake assumed to be a ball. The optical axes $A A'$ of the eyes $E E'$ intersect in the center of the ball B.

The distance of each eye from the ball being the same, the total perception of the surface of the ball is for each eye determined by the same physiological angle and the total visual surface of the ball is controlled by the angle D. The surface $F F'$ is seen by eye E and the surface $G G'$ by eye E' . The overlapping of these momentarily visual surfaces shows us a binocular perception of surface $G F$ and respectively monocular perceptions of surfaces $F G$ and $F' G'$. By the convergence of



the optical axes $A A'$ a total ball image is shown on a spot of each retina identical in its respective position to each individual optical axis.

These identical conditions of size and retinal location produce in their overlapping angular values the three dimensional nerve reaction which we call the stereoscopic effect.

Diagram Fig. 2 shows the same ball photographed by a lens of the same focal value as the above assumed momentary focal value of the human eyes with the same distance between the ball and the lens.

The visual surface of the ball is for this lens controlled by a physical angle which we can assume to be equal to the physiological angles of the two eyes.

(Continued on Page 27)

Hal Hall

SAYS

The World's Football

HAVE often wondered why so many writers, near writers and would-be writers use so much space in papers, magazines and pseudo-smart magazines knocking everything pertaining to the production end of the motion picture industry.

It would seem that the old custom of selling life insurance when you cannot do anything else has changed to knocking the film producers when you cannot do anything else. The motion picture industry seems to have become the world's football to be kicked around at sundry and all moments by people, in many cases, who would in all probability make more mistakes in a minute than the average producer makes in a year.

True, the film producers make blunders—terrible blunders. But what of it! Why does some young whippersnapper fresh from college, or some old timer who, often, is sore because he or she cannot get a studio job, think he or she has the sublime right to sit down and criticise men who have forgotten more than a lot of them will ever know? At times this criticism grows absolutely sickish. A lot of foolish tripe handed out mostly by people who have never had a day of experience in the business of making motion pictures. Isn't it nearly time it was stopped?

Some of these criticisers remind me of a crowd of little puppies snapping at the heels of a big, good-natured St. Bernard dog. And their blurbs mean just about as much to the world as do the barks of the pups.

A big department store fails. There has been poor management. But you do not see huge blurbs—nasty, cheap, cowardly attacks made upon the store executives by newspaper or magazine writers. A big oil company fails to pay its regular dividend. There is nothing said. A big steel company reduces its yearly dividend by more than half. But there are no sore-heads writing sarcastic comment about the inefficiency of the steel executives.

Then, why shoot at the motion picture business? What if the producers do waste money. It isn't anything out of the pockets of the writers who criticise. What if they do make some bad pictures. It is the picture company that suffers. Why shout about it? It is none of my business how the boss of any studio runs his studio, so long as he does not injure me. Then, why the nasty criticisms?

An English professor at Brown University told us one day, years ago when we were in the college class, that "those who can, do; those who cannot, criticise." Maybe he was right.

Advertise Now

ON EVERY side you hear business men complaining of poor business. An analysis of their methods reveals in most cases that they have eliminated most of their advertising. This seems a poor policy. It always seems to this writer that the time to advertise is when business is bad. Then you are seeking new business. When business is booming and you cannot fill orders, why advertise. Moral: advertise now.

This Month's Cover

A COMPARATIVE new-comer to the screen is seen on this month's cover of this magazine. She is Frances Dade, a very personable young lady, whose advent into pictures has been a decidedly pleasant one and her future looks very promising.

Miss Dade really should be a good actress because her mother, Frances Pemberton, was an accomplished stage actress who played with no less a star than Joseph Jefferson. Miss Dade is a native of Philadelphia. Her first stage experience was in "Gentlemen Prefer Blondes," a small part. Her first real opportunity came in "Escapade." She had never given pictures much thought until one of Samuel Goldwyn's scouts saw her in a Broadway play and asked her to call at the Goldwyn office. A screen test was made and shipped air-mail to Hollywood, with the result that Miss Dade was given the ingenue role in "Raffles," in which Ronald Colman was starred. After finishing this picture she was loaned to R-K-O where she played the feminine lead in "He Knew Women." Paramount then borrowed her from Goldwyn who had given her a contract, and she played opposite Cyril Maude in "Grumpy."

Her most recent pictures include "Mother's Millions," "Daughter of the Dragon" and the lead in a Ken Maynard Western. Miss Dade is a very sensible young lady, and proves it beyond a doubt by having the able and scintillating Scoop Conlon as her publicity representative.

Cinematographic Annual

DAILY, numerous letters reach our desk inquiring about the second volume of the Cinematographic Annual.

Remembering the embarrassing delay in the delivery of Volume One last year, we have held up our announcement regarding Volume Two until we were certain of delivery date. Yes, there will be an Annual this year. Volume Two, Cinematographic Annual, will be off the press the first week of November and deliveries will start about November fifteenth.

It is gratifying to note that scores of orders for the second volume have already been received at this office, and the orders are coming in daily. It makes us feel that the first Annual was really worth while. And we can promise you that the second volume will be infinitely better. Eleven months of effort already has been put into the book and we sincerely hope that you will all like it. The scope of the book has been broadened a bit, and there will be something of interest to everyone whether he be connected with the motion picture industry or be an amateur cinematographer or just a snap-shot enthusiast. The pictorial section has been enlarged to 64 pages, and the pictures will delight the souls of picture lovers.

Sound, Cinematography (professional and amateur), Laboratory, Projection, Art—all have their place—all handled by men whose names are known the world over. If you have Volume One, you will surely want Volume Two—and if you missed the first volume, we suggest that you send in your order for both volumes, as we have a very few of the first issue left. First come, first served.



1. "—Listen, old-timer—when are you going to give me a break on the outside?"

2. "I'm plenty sold on this Eastman Panchromatic—it's certainly done wonders for me!"

3. "I got a big kick out of that first superpan that we shot—"



4. "—and then when you flashed that anti-halo on me—I was rarin' to go—"

5. "Frankly—I gave you the horse-laugh when you wondered how it would go over! What a cinch!"

6. "Remember how it 'wowed' the boys at Metro and Paramount and R.K.O.?"



7. Depression my eye! Guess that's one thing our anti-halo is not sensitive to—"

8. "But on the level now—do you mean to tell me that any of the boys are still on the fence?"

9. "—What! Hey, lemme out of this thina!—I'm Going To Work—"

Putting the Realism Into "Dirigible"

(Continued from Page 15)

ture we had to build was so huge that it absolutely had to be built right on the floor of the stage; otherwise, we would have had to have ripped off the roof! So I was up against it good and proper to contrive to light the thing properly. After quite a bit of grief, I finally hit upon the plan of using the new Mole-Richardson "Sky Lights," which had just been introduced.



Mr. Walker at camera shooting a sequence of "Dirigible."

These units consist of a very shallow aluminum reflector, with no barrel at all. I laid these on the floor under the doped linen cover of the framework, about four or five feet apart, and interspersed them with ordinary broadsides under the observation holes. These, with the feeble assistance of the "practicals" (in this case the small, frosted incandescent lamps, which, strung along about ten feet apart over the cat-walk, illuminate the interior of the actual ship), furnished all of our lighting. These scenes were intercut with those actually taken on the "Los Angeles," and the lightings matched so well that I, myself, could not tell which was which.

Another rather interesting scene from the standpoint of the lighting and photographic problems it offered, was the vast snow-field which we built out at Arcadia. Mr. Briskin's desire for absolute realism sensibly stopped short of sending the company to the Antarctic for our several snowfield sequences, and Antarctic conditions are not duplicated in any of our nearer snow-sections, nor in the actual Arctic; so we built ourselves an Antarctic in Southern California. It was no miniature, for it had to be large enough to allow a real Trimotored Fokker transport plane to land, take-off, and, eventually, to crack up. So we covered a large area with the conventional movie snow materials—bleached cornflakes, marble-dust, and the rest, interspersed with the necessary rocks, ice-cakes, and mountains. The glare that this produced under a California sun can, perhaps, be imagined. What a problem it was to make it look properly cold and barren! The sound department ruled out our good old standby of silent days—blue-tinted film, so it was up to us to achieve our effects entirely with the camera. The result was that we shot the scene through so many filters that we could hardly see the image on the ground-glass of the camera. But even with properly heavy color filters, and three or four Neutral Density filters, there was quite enough left to impress an image on the film—and we were successful in getting across the impression of the cold barrenness of the Antarctic.

But, after all, perhaps the scene that gave me the greatest personal pleasure of all was one of the least spectacular ones in the film. It was a close-up of the leading lady, Fay Wray, which I made with a lens which I had designed and had built myself. For some time I had had the idea of making a soft-

focus lens of certain definite characteristics, and finally, just before starting "Dirigible," I had found time to design the lens and have it ground. Then, during the production of the picture, came a single scene where I felt that it would be of real value. It was in the scene where Miss Wray is bidding good-bye to her husband, who is setting out, against her wishes, for a flight to the South Pole: she feels that she will never see him again, whether he returns or not. I had photographed the scene in the conventional manner, with gauzes and diffusion discs; Miss Wray had given a magnificent performance. But I felt that I could make the scene even more telling with my new lens. I broached the subject to the director; he refused, as he felt unwilling to call on Miss Wray to repeat such a harrowing scene after it had been photographed so well, and acted so perfectly. But when I asked Miss Wray, she was quite willing to repeat it for me; so I mounted the lens on the camera, and we made one more take. When the rushes were seen, all of them, even Mr. Capra, agreed that my lens had really made a fine scene better. And that, to me, was the greatest thrill of the picture, for the rest was all in the days' work, but this was more than that—it was my own individual contribution to making "Dirigible" an outstanding work of motion picture craftsmanship.

Len Roos Abroad for Tanar British Factory Opening

LEN H. ROOS, A. S. C., F. R. P. S., vice president and general manager of the Tanar Corporation, Hollywood, left Hollywood the last week in July for London and other foreign cities. Mr. Roos goes to London for the official opening of the British Tanar factory which takes place this month.

The foreign business of the Tanar Corporation has grown so much, according to Mr. Roos, that a British factory seemed advisable. It is indicative of the remarkable growth of this organization which was started by Mr. Roos less than two years ago for the manufacture of portable sound-on-film equipment.

Mr. Roos will go from London to Paris, the Hague, Barcelona, Brussels and Berlin for the establishing of branch agencies in those cities. He will be met in Paris by Mr. Merkel of the Tanar foreign department, and the pair will travel together throughout Europe. Mr. Roos expects to be gone several months.

"Armor Plated" Film Being Put On Market

"Armor plated" film, on which the perforations are protected by a thin copper band, is being put on the market by Precision Engineering Co. of Philadelphia. N. Pederson, president and general manager of the company, is also the inventor of the process, which is guaranteed to prevent tearing or "breaks" due to worn perforations. The copper band is so attached to the film that it cannot loosen, although it does not enter the "field" of photography. British rights are said to have been sold for a large sum of money. Pederson is expected in New York next week to make American distribution arrangements.

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Four Musketeers

(Continued from Page 9)

tory work is of very poor quality. I must, however, except the Japanese laboratories from this stigma, for the many stills which we had developed in that country were most capably handled.

While we were in China, we were entertained by Mei Lan Fang, who is probably the greatest of Oriental actors. Of course we filmed many scenes of him and of his home; one bit which I still remember with amusement was a sequence in which he and Doug exchanged clothes and personalities: both men have a fine sense of comedy, and it is hard to say which was the more ludicrous, Doug's attempts to look and speak Chinese, or Mei Lan Fang's imitation of Doug.

In Japan we had the unique experience of visiting one of Japan's picture studios. It is difficult to believe that the studios of Japan annually produce more feature pictures than do our own plants in Hollywood. But these remarkable people have been producing motion pictures since 1897—two years after the importation of the first foreign reel. Today there are nearly 1,400 theatres in the country, the majority of which show Japanese films exclusively. There are about a dozen producing companies in the country, the largest of which produces more than 100 feature films per year: the total production for the country is in the neighborhood of 600 features each year. Viewed by American standards, their production costs are amazingly small, averaging about \$10,000 per picture. Naturally, their technical facilities are somewhat limited, but it is astonishing to see what creditable results their cinematographers manage to achieve. Despite the large domestic production, American films are very popular, and as Doug is their greatest favorite, he was lionized everywhere he went. To my surprise, I came in for a good share of this popularity myself, not only because I was a member of Doug's party, and had photographed several of his pictures, but because I was a cinematographer. The Japanese are enthusiastic photographers, and both the amateurs and the professionals follow the work of our American cinematographers as zealously as our own fan public follows the careers of its favorite stars. When we went to visit the Kamata Studio, I was amazed when the Kamata Studio Cinematographers Club welcomed me by presenting me with a membership, a beautiful pin, and a scroll upon which was inscribed the titles of every picture that I had photographed! It is, in fact, very difficult to describe the veneration in which the Japanese professional cinematographers hold the professional cinematographers of this country.

In the Philippines, Doug called on General Emilio Aguinaldo, the famous leader of the Philippine Insurrection of a few decades ago. We added the General to our photographic 'bag,' and found him, in the process, a most interesting gentleman.

In Cambodia, our greatest adventure lay in our visit to the mysterious and beautiful Angkor Vat, a vast and wonderful temple-city built by the forgotten Khmers: who they were, no one knows, nor where they went; but they left behind them an unforgettable monument in this great temple. Of course we photographed it, and got not only scenes showing its impressive size and beauty, but more familiar scenes of Doug doing his acrobatic stunts among its towers and terraces.

Then off again to Bangkok, for Doug was all agog over the possibilities of elephant hunting in Siam. Before launching on this thrilling pursuit, we were received in Bangkok by their Majesties King Prajadhipok and Queen Rhambai Barni. Their Majesties are most democratic, and their personal charm is sufficient even to rise above the formality of a Royal presentation. Later, in more informal conversation, I found King Prajadhipok to be most intensely interested in cinematography, both as a personal recreation and as a vital government project. His Majesty has a very complete camera and laboratory equipment, both for 16mm. and 35mm. work. The Siamese Government has a special department devoted to the production of

educational films, which form an important part of King Prajadhipok's policy of modernization. The importance of the department may be judged by the fact that it is headed by the King's uncle, Prince Svasti.

One evening we were invited to the Palace, where we were privileged to view a picture which had been personally directed by the King. It was most interesting, particularly as it showed the enthusiasm with which this progressive ruler is adapting the film to serve the needs of his people. The photography suffered considerably because the film used was the old orthochromatic stock rather than panchromatic, and particularly because the cinematographer had been too polite to use reflectors, which, he told me, bothered his actors.

India, after the friendly, cheerful people of Siam, was rather an anticlimax, for her people seem to suffer from inherent suspicion and melancholy. Until I visited India and China, I had never appreciated the meaning of the phrase "teeming millions." There is far more than humor in the remark of the traveller who, when asked about China, dryly replied that it was "vast—and full of Chinamen." The congestion of population of both these countries must be seen to be believed.

Nevertheless, our hosts in India, both British and native, spared no effort to make us comfortable and happy. Doug was in his element—splendid companions, thrilling hunting, and plenty of golf. Our hosts arranged several tiger and leopard shoots for us, and very spectacular affairs they were. The hunting is done from elephant-back—a very prudent method, since My Lord, the Tiger, is a very fierce and wily customer, and quite capable of evening the apparent odds that high-powered rifles and elephants seem to lay against him. Photographically, a tiger-hunt is a very spectacular subject, and a very difficult one. The long line of hunting elephants, the sudden, lightning-like rushes of the tigers, the picturesque native beaters and mahouts all combine to make a most unusual picture. At the same time, it is far from a perfect subject for photography. The lush greens of the jungle, and the thick foliage overhead do not form a particularly actinic background. The cameras are, of course, carried on elephants, and although they are certainly large enough to be a very nice camera-platform, they are not at all times as stable as a studio parallel. But it is the tiger himself who is the greatest problem, for no one can ever tell just when or where he will break cover, and when he charges, he does so with incredible speed. For this reason, after the first attempt, I practically abandoned my big camera, and used the Eyemos entirely. How thankful I was for them! I could hold them in my hand, at the ready, like a hunter's gun: then when Mr. Tiger darted out, I had at least some chance of getting a picture of him—a literal snap shot. Doug bagged several tigers and leopards, and I had equally good luck in bagging them with my cameras.

All along our route, Doug found his favorite diversion—golf—in abundance. We golfed in overcoats in China, and in shorts and topi in India. We even golfed within a stone's throw of the superb Taj Mahal at Agra. And we golfed with so many different types and races of people that Doug now claims that he can play golf in any language!

Even thicker than the golf-courses were the users of amateur cine-cameras. It seemed as though every tourist and half the richer natives had at least one. All of them, of course, were eager to photograph Doug. And when they learned that I was a professional cinematographer, I, too, was mobbed. If Doug was deluged with requests to pose, and for autographs, I was almost as completely submerged by questions on exposure, on focusing, on film, on filters, on lighting, on "how do they do it in Hollywood" (which covers a multitude of sins!), and on every other subject imaginable; but first, last, and always on exposure. Even those that used really accurate exposure-meters seemed to prefer to trust my professional judgment of such matters. In the jungles in India it seemed very difficult for them to believe that, although the intensity

(Continued on Page 43)

Du Pont Panchromatic Negative Film

by **DR. V. B. SEASE**

Director, Redpath Research Laboratory

DO you remember the motion picture of a decade or two ago—its chalk and soot silhouette, its granular, squirming structure? Contrast that picture with the smooth texture, the lifelike relief and gradation in light and shadow of the modern cinema. Many things have contributed to this improvement, but one of the most important has been the introduction of panchromatic negative film.

Du Pont takes a just pride in the part it has played in furnishing such a negative film for the motion picture industry. This accomplishment is one of its best examples of applied research. The company's experience in producing nitrocellulose made the manufacture of celluloid film a logical undertaking. So a comprehensive investigation of the fundamental principles underlying photographic emulsion manufacture was conducted over a period of six or eight years with the idea always in mind that only a superior product could justify the entry of the du Pont Company into the motion picture field. The result was a photographic emulsion with very fine grain, high sensitivity to light, long scale of density gradation and a wide latitude in exposure and development. Some of these qualities had been achieved to a certain extent in the industry before, but never had so many desirable characteristics been incorporated in a cine'film.

This emulsion, however, was only sensitive to the blue wave lengths of light. To preserve its valuable qualities and make it panchromatic—that is, capable of recording in gray tones all the colors visible to the eye—required much more research.

Earlier experimenters had demonstrated the broad principle of color sensitizing photographic emulsions by the addition of certain dyes. Minute traces of these dyes, insufficient to color the silver grains or the gelatin in which the grains are suspended, are absorbed by the silver grains which thereafter show enormous increase in sensitivity toward light of certain

wave lengths. The wave lengths favored depend upon the specific nature of the dye that is used.

The present high-speed panchromatic negative is a product of intensive research in the synthesis of new dyes, the study of the relationship of structure of a dye molecule to sensitizing action, the manufacture of particular types of silver suspensions receptive to these dyes, and the methods of incorporation of the dyes to produce the maximum sensitizing action.

Not only has panchromatic negative helped to bring about a great improvement in the quality of the screen, but it has made possible the revolutionary changes that were required in studio lighting with the advent of sound pictures. The old type of arc light supplied an intolerable amount of extraneous noise. The incandescent lamp is ideal from the standpoint of silence, but it could not have found a place in the modern studio if panchromatic film had not been available. The incandescent lamp is relatively weak in blue, the rays necessary for action on the old types of negative. It is rich in yellow and red rays and the panchromatic film can make full use of practically all incandescent emission.

This special fitness of panchromatic film for incandescent lighting not only brings about a considerable saving in current but gives the actors a more normal environment. The powerful lights of the former days were not only uncomfortable but often injurious to the eyes of the players and studio workers.

The sensitivity to incandescent light of the special du Pont panchromatic brought out this year is at least double that of the regular product which has been so universally approved during the past four years. In actual productions at Hollywood it has been found necessary to reduce lighting amperages by one-half. It is sufficiently sensitive to take night scenes on Broadway or similarly lighted thoroughfares without the special hypersensitizing treatment heretofore necessary.



Entrance to the Dupont Film Plant in New Jersey



Still by John Ellis

JOHN BARRYMORE and MARIAN MARSH

in

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Cameraman, Chic McGill

Make-up Artist, Perc Westmore

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VOLUME 2



Cinematographic ANNUAL

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To be included among the advertisers in this volume is a mark of real distinction. No wise-thinking concern catering to the picture industry or to the home movie maker can afford to remain out of its advertising section. ¶ Forms will be held open as long as possible, but to be assured of space write immediately for advertising rates to the

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.. In the Realm of Sound ..

The Operation and Uses of the Rapid Record Oscillograph

THE RECORDING oscillograph is the stethoscope of the sound engineer. Just as accurate diagnosis precedes the doctor's prescription, the scientific control of sound in its infinity of complex combinations is dependent on a means of analysis and evaluating its components. Such analysis must be made easily, quickly and accurately.

The rapid record oscillograph recently developed by the Bell Telephone Laboratories and now in use by the Acoustic Consulting Department of Electrical Research Products in its acoustic work fulfills these requirements in the form of a permanent photographic image of any sound picked up by the associated microphone. Pure tone or complex frequency from 30 to 6000 cycles is recorded on a graduated strip of paper, 35mm. in width, the coordinates of which indicate directly the frequency, pressure and duration.

In its application to sound analysis, the output of the associated microphone is impressed on the string of a specially designed galvanometer. The string is of duralumin less than .001 inch in diameter stretched between the poles of an electro magnet and tensioned to a definite frequency. Suitable attenuation at the point of natural resonance results in uniformly linear response. Transient currents from the microphone passing through the string cause it to vibrate in proportion to the amount of impressed energy. Three such strings provide means for simultaneously recording data from as many sources, but any of the galvanometer strings may be used independently of the others.

By means of a very simple optical system and a tungsten lamp as a source of light, the shadow of the vibrating string is projected upon a moving strip of sensitized paper. In a similar manner, abscissa lines are projected on the oscillogram from a screen of parallel lines engraved on the optical system. Ordinate lines are obtained from the projected shadow of the spokes of a synchronously rotated wheel and represent time intervals of .001 second. The shadows of the strings and coordinate lines appear on the developed oscillogram as white lines, strongly contrasting with the dark grey of the portions which were exposed to direct light.

The photographic mechanism is essentially a complete camera and laboratory where the sensitized paper is exposed and passed through the developing and fixing solutions automatically. The speed of the paper through the light beam may be set within very wide limits, but at its maximum approaches a rate of 15 miles per hour. As this is much more rapid than the permissible rate of processing, it was necessary to provide intermediate storage for the exposed paper. This is accomplished by a light-proof storage tank where it is loosely folded until automatically withdrawn by the conveyor belts leading it through the process tanks.

The average oscillogram is available for inspection within one-half minute from the time the exposure trigger is released, and if it is wanted for further reference or enlargement may be completely dried within fifteen minutes. Extreme sharpness of the image makes possible enlargement to four or five times original size for minute inspection where desired, but this is seldom found necessary.

In the study of sound, the rapid oscillograph has proven extremely useful. It has simplified the scientific analysis of interference phenomena and distribution of sound energy because of the ability to record simultaneously the initial sound at its source and the resultant sound energy received at widely separated locations in the auditorium. It thus becomes an instrument with which the acoustical engineer may qualitatively inspect reverberation characteristics while relying on the reverberation meter for a more complete and detailed study.

Absence of distortion and extreme simplicity of operation have developed useful applications of the rapid oscillograph in many fields. For investigation of sound recording and reproducing equipment, amplifier and tube characteristics and in all research where oscillograms of audio frequencies are desired has proven most useful.

Three-Lens Turret Makes Exact Position Possible

A THREE-LENS turret that will accommodate three lenses of any size necessary for the presentation of sound-on-film, disc, silent or Magnascope, is being offered by Basson & Stern, sound accessory device manufacturers of Brooklyn. With the use of this turret, exact position register is possible, the company states. Each lens has a separate focusing device, and there are also provided adjustments for up-and-down and side-ways movements of each lens, thus insuring exact line-up of picture on the screen without it being necessary to shift the projector.

Weber Corp. Supplying Synchrofilm A. C. Units

COMPLETELY new A. C.-operated power supply units, designed for the elimination of all batteries from the new Synchrofilm sound equipment and for replacements for batteries in use with equipment installed, have been developed and are now being offered by the Weber Machine Corp. of Rochester, N. Y.

The equipment is made in two units, which consist of an "A" unit for the supply of current to exciter lamps and also for the filaments of the head amplifier tubes, and a "B" unit for supplying plate voltage to the head amplifier tubes and photo-electric cells.

All units are ruggedly built, on pressed steel chassis, and are supplied with ventilated steel cabinets for wall mounting. The entire assembly and wiring of the component parts make a compact and efficient unit, the method of wall mounting having proven very desirable in projection rooms where the floor space is limited, it is declared.

Portable Public Address System

A COMPACT portable public address system known as the Amplion Portovox, consisting of an Amplion unit, exponential horn, amplifier and microphone, and which can be packed in two small packages for transportation, has been put out by the Amplion Products Corp. of New York.

Laboratory Department

Conducted by EMERY HUSE, A. S. C.

Principles of Sensitometry and Their Practical Application

Part 4

EXPOSURE

A DEFINITE concept of the term "exposure" should be had before a detailed discussion is entered into relative to "sensitometers"—those instruments by which controlled exposures are made in the practice of sensitometry.

The problem of the exposure of a photographic material involves the intensity of the light source and the time of exposure expressed in seconds. The proper combination of these two elements will produce after correct development a range of densities dependent upon the speed of the emulsion and which will be proportionate to the brightness (intensities) in the object photographed. Exposure is usually defined as:

$$E = I \times t$$

where "I" is the intensity and "t" the exposure time in seconds.

The intensity of the light source is usually expressed in terms of meter-candles so that the exposure is finally expressed in terms of meter-candle-seconds.

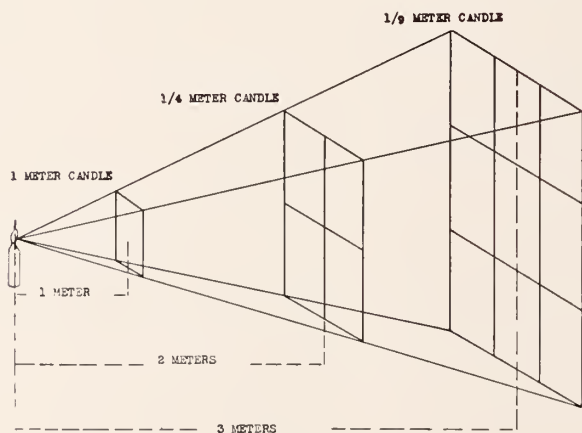


Fig. 2

A meter-candle may be defined as the brightness of one candle power falling upon an object at a distance of one meter. If the brightness of a source is 10 candle power and the distance one meter, then we have on the object a brightness of 10 meter-candles. If we change the distance between the source of the illumination and the object the brightness will vary inversely as the square of the distance because the cone of light which covers a definite area at a meter will at two meters embrace four areas of the same size. At 3 meters, 9 areas will be embraced and so on; and since the same light that falls on one area at one meter is spread over 4 areas at two meters, it is naturally only one-quarter of the strength on each of the 4 areas. Bearing this in mind, if a light source of 25 candle power is acting upon an object at a distance of

one meter, by use of the same reasoning as previously applied, that object will be illuminated by 25 meter-candles. Now, if this object is photographed and the time of exposure is one second we have as a result an exposure equivalent to 25 meter-candle-seconds. To expand a little further, if we move the 25 candle power source so that it is 2 meters from the object, the intensity then becomes one-quarter of 25 meter-candles, or 6¼ meter-candles. This is computed from the above statement that as the distance changes the intensity will vary inversely as the square of the distance. In this case we have increased our distance by a factor of 2, and 2 squared is 4; hence the intensity at the increased distance must be one-quarter of the previous value. Figure 2 illustrates diagrammatically this intensity as the object distance from the source is altered.

All of the foregoing represents a condition which may be set up in a test laboratory. In the photographing of persons and scenes the brightness of the various objects to be photographed can be measured by an instrument known as the "illuminometer." It is, therefore, possible to measure actual brightness in a scene of any type so that knowing the time of exposure and the degree of development the resulting photo-

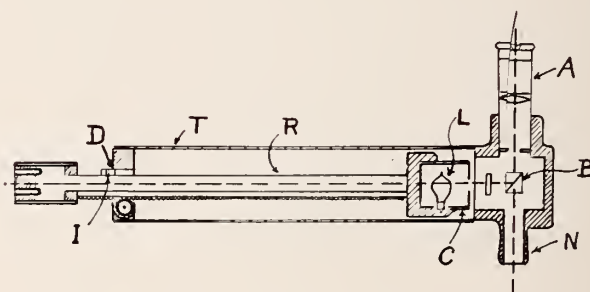


Fig. 3

graphic effects can be precisely determined.

It will be well to diverge for a moment and discuss briefly one of the well known illuminometers which is used for this type of work. The instrument referred to is the Macbeth Illuminometer which is manufactured by the Leeds and Northrup Company.

The essential part of this instrument is shown diagrammatically in Figure 3. It consists of a telescopic eye piece "A" a Lummer-Brodhun Cube, "B", and a diaphragmed lamp carriage "C", which is found in the tube, "T". The lamp carriage carries an electric lamp, "L", which is the working lamp carriage and is moved up and down in the tube by means of a rack and pinion operating upon a square brass rod "R" to which the carriage is fastened. The rod is seen projecting from the bottom of the tube at "D". On one side of the rod to which the lamp carriage is attached is engraved the correct reading scale calibrated from 1 to 25 foot-candles. These values can be converted readily to meter-candles by using the value of 10.76 as a multiplying factor,—thus,

$$\text{Meter-candles} = 10.76 \times \text{foot-candles}$$

An index point is attached to the bottom of the tube at "1". The scale on this instrument follows the inverse square law previously mentioned.

In addition to the part just described, the Macbeth Illuminometer contains a second piece of equipment which is called the "Controller." The controller comprises a battery for operating the lamp, a mil-ammeter, and two close regulating rheostats, all essential for the proper manipulation of the instrument. To use the instrument, the nose piece "N" is directed at the area whose brightness is to be measured or at a test plate supplied with the instrument. This test plate can be placed in the field of view and a photometric balance obtained between two concentric circles which are visible within the instrument upon looking through the eye piece. One circle is illuminated by the light from the working standard within the instrument, while the other is illuminated by the light from the light source under measurement. This instrument is very easy to manipulate and is very reliable from the standpoint of the quality of the results obtained.

Screen Definition

(Continued from Page 17)

The size of this surface, photographed as a circularly bounded image, is controlled by the diameter of the circle $H H'$ which is smaller than the actual diameter of the ball shown as a full line. This difference is more clearly shown in Diagram Fig. 3 where relative values of ball size and lens distance are intentionally exaggerated.

The surface seen by each human eye is under the assumption of similar ball size and distances the same as photographed by the lens. The overlapping binocular retinal and nerve effect, however, produces a brain image of somewhat elliptical configuration, the major axis, controlled by the full diameter of the ball lying in the direction of the parallax of the eyes, the minor axis at right angles thereto being controlled by circular surface of smaller diameter than full ball diameter.

It is the perception of and brain reaction to this distortion which produces the so-called stereoscopic effect.

That the eye is especially sensitive to distortions in the parallax direction is the reason why we see any photograph or other normally produced picture with an enhanced depth effect when we look at the same through an **uncorrected** positive lens system.

The eyes respond to distortions so produced only by the higher parallax sensitivity and the distortions in other directions are suppressed, with the result that our nerve reactions impress upon our sight sense a picture similar to that of the three dimensional objects itself.

The comparative analysis of a modern binocular photographic system as used in so-called stereoscopic cameras shall be taken up in the next article.

Technical Products Co.

"JACK" MARSTON, formerly with M-G-M Studio, Camera Repair Shop and who was with them over 6 years is now connected with Technical Products Co., Hollywood, in charge of their shop. This company has been doing studio equipment and camera repair work for nearly a year. They make all kinds of special attachments, such as lens mounts, matte boxes, 16 mm. camera equipment, etc. Also the Technical Products Co. are developing some specialties of their own.

Off for the North



HERE we have Glenn H. Kershner, member of the American Society of Cinematographers, and the noted explorer, Donald B. MacMillan, aboard the good ship, Bowdoin. Mr. MacMillan is making his fourteenth exploring trip to Labrador. This time he took Mr. Kershner along to make a cinematographic record in Multicolor. Mr. Kershner flew from Hollywood in a plane that has been taken on the expedition. Most of the photographic work will be from plane.

Chinamen, About to be Executed, Strive for Creditable Movie Camera Pose

IF YOU were about to be executed, would you worry about how you would appear to a movie camera?

W. H. Jansen, A. S. C., well-known news-reel cinematographer, now in America for a short stay, took many moving pictures of executions in China in connection with the Canton Red uprising, and he says that man after man just about to be shot by the executioner would direct his last glance to the lens of the camera and assume the best possible pose.

Mr. Jansen used an Eyemo movie camera all through those turbulent Canton days. He says things were frequently moving too fast to permit a photographer allowing himself the time to set up a tripod.

Mr. Jansen, who has been in China for the past nine years, is visiting this country to secure proper equipment for making sound pictures in the Far East.

He is especially enthusiastic over the possibilities of talkies in educational work in China.

"For nearly a decade silent moving pictures have been used to an increasing extent as an educational medium in the Orient," he says, "but sound pictures are sure to be more extensively used."

He is planning the production, in China, of sound pictures on such subjects as hygiene, good citizenship, and agricultural methods for use in Chinese schools. He also plans to produce authentic sound pictures for use in other countries on interesting phases of life in China today.

Mr. Jansen was elected to membership in The American Society of Cinematographers last month.

Six Location Films Scheduled by Radio

RADIO Pictures has made plans for the part filming of six productions on location. The pictures listed under this category, according to William LeBaron, are "Marcheta," which will be filmed partly in Barcelona and Madrid, Spain; "The Bird of Paradise," with an Hawaiian setting; "The Dove," in Mexico; "Pent-house," New York City and Wyoming; "Frontier," in the Dakotas, and "Home Town Laughter" on a distant site now being sought by Director Gregory La Cava.

A Romantic Journey

(Continued from Page 13)

"One of the most interesting parts of the trip was a 4500-mile automobile trip, mainly through desert wastes. They have specially equipped automobiles down there with twelve wheels for use over the desert. Where the ordinary automobile would sink hopelessly in the sand these cars roll along as though on a concrete highway. Mile after mile we traveled over desert where the shifting sands had entirely obliterated the trail. But concrete posts marked the way, and all we had to do was to follow them and we knew we would not become lost.

"Every now and then we would arrive at an oasis, perfect little paradises with cool, sweet water and drooping date palms. We continued on into the interior to Fort Morocco at Quadzazet. This is the farthest inland post of the famous French Foreign Legion, and is the outpost of civilization down there. Standing on the walls of the fort you are shown a small river just a short distance away. That stream marks the danger line for travelers. Across that line are the fightingest Riffs in the world. To cross the river invites a bullet. Likewise if they cross to the fort side a bullet sings at them. A pretty spot, but not one where you would wish to settle down.

"From Africa we crossed the Mediterranean to the South of France. Through France we photographed scenes for our pictures, and then we went on into Germany where we made some really outstanding pictures. One scene was at Heidelberg where we photographed a group of real students of "Old Heidelberg" singing the stein song at the very scene of "The Student Prince." I think the producers rightly named this series of pictures when they called them 'Romantic Journeys,' for we had a romantic journey in their making."

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Raytar Lenses Ready for Distribution

BAUSCH & LOMB Optical Company has appointed the Mitchell Camera Corporation, Hollywood, California agents for the distribution of their new Raytar Motion Picture Lens. A stock of lenses is carried on the west coast and orders can be filled promptly.

Erpi Engineer Honored

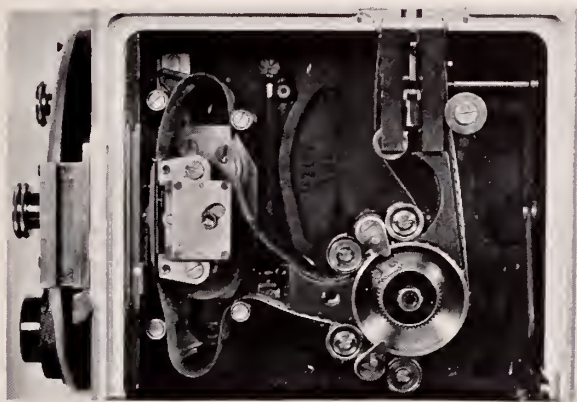
DR. JOHN G. FRAYNE, consulting engineer in the West Coast recording department of Electrical Research Products, has been awarded the grade of Fellow by the American Physical Society, a distinction reserved for scientists of outstanding accomplishments.



An Amateur Afield

Drawn by Ransom Hall

New Bell & Howell Standard Camera Silent Unit "I" Mechanism



Silent unit "I" pilot pin mechanism in B. & H. standard camera showing threading and arrangement of roller assemblies to eliminate loop slap.

ALL CAMERAMEN are familiar with the fixed type of registering pilot pin which was an exclusive development of the Bell & Howell Company for their standard cameras.

Since the inception of sound, there has been a long felt need for a mechanism that would give the positive and particularly exact registration obtained with the familiar B & H pilot pin mechanism, but which would be silent enough to use on a sound stage. The Bell & Howell Company is, therefore, particularly pleased to advise that this has been accomplished in the new Silent Unit "I" pilot pin mechanism.

The little roller which engages in the main cam is now made of fibre, and the two slides which engage on the periphery of the main cam are equipped with fibre inserts. The oscillating rocker arm and register leaf parts are cut away and lightened as much as possible without sacrifice of rigidity and safety.

While these silence the mechanism considerably, two other improvements have been developed for further silencing the camera equipped with this mechanism.

First, the camera itself has been equipped with a special cam. The stroke of this special cam is about one-half of that employed in the regular camera. The idea of this is that the shortened cam controls the stroke of the register leaves exactly to the minimum possible limits of movement necessary to secure perfect results. The cam is arranged so as to prevent the register leaves from "slapping" against the aperture, thus eliminating the main source of noise.

The second improvement is the little ball bearing roller assemblies, one set of which is installed in the camera frame itself, and the other set in the angle plate of the mechanism. These rollers serve to control the loop as shown in the photograph, and eliminate loop "slap," the second greatest cause of noise.

All in all, this development represents a definite improvement. It is attracting great attention due to the fact that the mechanism can be readily adapted to take bi-pack films, thus giving a silent, color camera. By merely interchanging mechanisms, regular black and white pictures can be obtained without adjustment to the focusing ground glass or any other make-shift arrangement for compensating for the difference in the focal planes of regular and bi-pack films.

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Amateur Movie Making

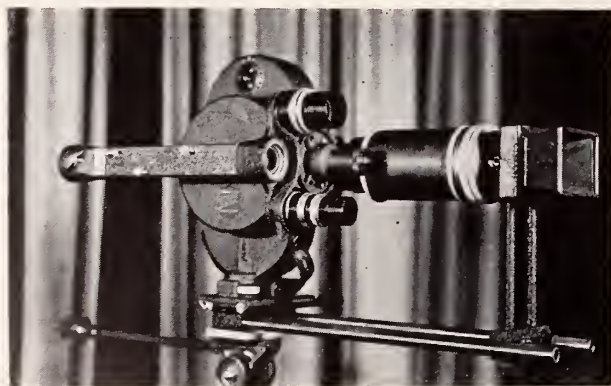
by WILLIAM STULL, A. S. C.

FROM the viewpoint of the professional cinematographer—or that of the advanced amateur—perhaps the greatest defect of 16 mm. cinematography is that it does not permit the use of professional filters. This is not due to any imperfection in the films used, but to the fact that only a highly limited range of filters is generally supplied for the smaller cameras. Of course, for the ordinary run of amateur cinematographers this is by no means an unmixed blessing, for in apparatus for the novice the chief requirements are simplicity and foolproofness. So the simplest of cameras and the 2x and 4x filters generally available are quite adequate—for the beginner. But for the more advanced worker, this extreme simplicity is often a real drawback, for it bars the use of the wide range of professional color and effect filters.

In common, then, with many another user of 16 mm. apparatus, I had felt this need, so when, some time ago, an excellent semi-professional matte box for 16 mm. cameras was announced, I looked forward eagerly to owning one. But unfortunately, its makers did not find it convenient to remain in business, so I was robbed of my matte-box. Since then, I have been promising myself that I would find time to evolve my own—but the necessary time has not been forthcoming.

But, one day last month Jackson Rose, A. S. C., walked into the office of the American Cinematographer with the clever little matte-box that he devised for the Leica still camera, and which was described in the July issue of this magazine. There was an excellent start toward a 16 mm. matte box! I secured one from Mr. Rose, and with surprisingly little difficulty, managed to adapt it to 16 mm. service. As Mr. Rose's device is generally available now, many another 16 mm. user may find it suited to his needs, so I will describe the means by which it was adapted.

A 16 mm. Matte Box



In so far as 16 mm. use is concerned, the chief requirements of a matte box are that it be capable of holding the standard professional filters, and gauze mattes; that it be mounted so that it can be adjusted along the axis of the lens; and that it furnish additional sunshade protection to both lens and filters. Two of these features Mr. Rose's device embodies; the third can easily be added to it.

The matte-boxes in professional cameras are generally mounted on a pair of rods extending horizontally in front of the camera, and firmly affixed to the tripod. The matte box

is mounted above these arms on a bracket which permits it to slide along them. In a 16 mm. installation, these supporting arms are best mounted in a block mounted between the tripod-head and the camera. My own device used a Filmo focusing alignment gauge, beneath which a solid brass block is fixed, with threaded holes for the matte box arms and tripod screw. The two matte box arms are made of $\frac{3}{8}$ " aluminum tubing of sufficient length to accommodate the device to the longest-focus lens used. In my own case, these arms are unusually long, due to my penchant for extreme telephoto lenses: 12", which is, oddly enough, two inches longer than the comparable units in the professional matte box made by Fred Hoefner, who made mine. Upon this slides the bracket which supports the actual matte box: this bracket locks in place with a set-screw. From this bracket extends the support of the matte box, in this instance, two $\frac{5}{16}$ " brass tubes. Into these tubes fit two small split-pins, which are in turn fitted to the lower part of the matte box. This unit can be used with any lens of less than $1\frac{1}{2}$ " in diameter, and forms an effective means of using the standard 2" square professional color, neutral density, and effect filters, and, if the camera is fitted with some means of focusing the full frame on a ground-glass screen, gauze mattes, as well. The cost of the complete unit was approximately \$50, of which the majority is represented by labor in making up the mounting. Such a device is by no means recommended to those whose cinematic efforts are confined to the snapshot type of work; but to those whose work is more advanced than this, it can be of real value.

Movies From Stills

In every vacation's filming, most of us come across scenes of some sort—usually of a scenic nature—which we need to complete our picture, but which we have been unable to photograph ourselves. When commercial film of these scenes is available, it is simple enough to buy such films, and cut whatever we may need into our own films. But often there are only stills available of such scenes, and, despite our need, we often hesitate to slow up the movement of our picture by inserting filmed reproductions of these lifeless stills. But—is it really necessary to copy the full area of these stills when we make our inserts? At least one amateur worker of my acquaintance does not think so. Instead, he uses only a small part of the still, and, if he wishes to show more than that bit, pans or tilts his camera around the still just as he would have panned or tilted on the actual scene. The result on the screen is surprising, for it keeps his inserts moving almost as successfully as though the actual scene itself had been photographed directly with the movie camera. Another advantage of this method is that it makes possible to the amateur the technique of "zoom" shots, in which the camera swoops up to or away from the object of principal interest. This is difficult—almost impossible—to do in straight 16 mm. camera work. Of course the stills used must be chosen carefully, as any prominent figures, or objects which would naturally be moving, will spoil the illusion. But the method is a great trouble, time, and expense saver. Try it!

Scripts

Among other things, the summer months seem to be a sort of open season on 16 mm. photoplays. And perhaps the greatest stumbling-block of most of these amateur production-units seems to be the question of stories. Suitable stories are not

(Continued on Page 43)

Professional Amateurs

Ann Harding is the Cameraman of Her Family

by **WILLIAM STULL, A. S. C.**

Photos by William Thomas

PLEASE, mister, is this a moving picture studio?"

"Yes, ma'am."

"Do they make moving pictures here?"

"Yes."

"Can I come in."

This is hardly the sort of conversation that one would expect to hear at the door of a sound stage on a studio 'lot,' where a large corps of receptionists, gate-men, and special police dedicate their lives to the thankless task of shielding film workers from just such interruptions, so I turned to look for the source of these queries. I had been visiting Hal Mohr, A. S. C., on the set at the Pathe Studio, where he is photographing Ann Harding in "A Little Flat in the Temple." As I turned toward the door, I saw a slim, golden-headed young woman in a simple sports dress, with a Filmo camera tucked under her arm, entering. Now, amateur cameras are another thing which is forbidden within the precincts of a studio—so I wondered still more. Then I saw the visitor's face—and wondered no more, for she was Ann Harding, taking a day off from her work—but none the less dropping in for a call on the less fortunate members of the company. In she came, with a smile and a pleasant word for everyone, on across the set to ask Director Milton when she would next be needed. Then over to Hal Mohr, where the Filmo came into evidence, as she asked his help on some photographic problem.

Then she was gone.

A few days later, I returned to the studio, and, finding her

on the set, asked her to tell me something about her interest in amateur cinematography.

"But there really isn't much to tell you," she replied. "You see, I'm just a very new beginner at it. A lot of my friends are really very good cinematographers; but every roll that I get back from the laboratory is evidence to me of how much I still have to learn about it. I don't do any unusual or clever things with my Filmo, the way Mary Astor and Wallie Beery and Leslie Howard do—but I do manage to have a lot of fun with it, just the same.

"It's rather funny, the way I got started with it, though. I gave the camera to my husband for Christmas several years ago—but I'm always the one who uses it. That same year Harry gave me a car—and immediately appropriated it the same way (he's still driving it!)—so perhaps we're quits, at that.

"We've used the Filmo principally for making record-films of our baby: to us, of course, she is the most interesting subject we could possibly choose. And it's been all sorts of fun making the pictures of her! She's getting to the age now, however, where direction is becoming a real problem. When she was smaller, she never noticed the camera, and we could get all sorts of little, characteristic scenes of her; but now she notices everything, and as soon as she hears the purr the camera makes when running, she immediately drops everything,

(Continued on Page 39)



Miss Harding and Director Robert Milton receive some technical advice on cameras from Hal Mohr, A.S.C.



Left to right, starting at top: 1, Beautiful wooden architecture everywhere. 2, Quimper. 3, A side street at Quimper. 4, My Quimper teapot. 5, Quimper Cathedral. 6, A rich farmer's wife. 7, Crowd at Pont L'Abbe. A little Bigouden.

Babbling About Brittany

by LAWRENCE GRANT

This is the fifth article of an unusually interesting series which Mr. Grant has written for this magazine. The next will appear in the September issue.—Editor's Note.

DOUARNENEZ, the place from whence, if you are fastidious, if you eat those of the very best sort, your sardines in oil will have come, is on the extreme west coast, and these delectable morsels are caught in the lovely Baie de Douarnenez.

The nearest rival to this fishing town is Concarneau, but I do not think they can boast of anything like the yearly catch that is brought in here.

What the records are now I do not know, as all these notes I am looking over were made more than fifteen years ago. Then there were about eight hundred fishing boats, taking about four thousand men to man them, and bringing in a hundred million fish a year.

Some of the larger ones are sent off to Paris to be eaten as fresh sardines, a small quantity consumed locally and the rest canned in olive oil by an army of girls and women.

The real flavor of a sardine depends not only on the fish, for all sardines out of the sea on this west and southern coast of Brittany taste the same, the small ones being a little more delicate than the larger ones, but on the handling in the factory, and more than anything else on the quality of the olive oil used. Therefore, if you have a palate, buy the most expensive brand, for sardines packed in poor olive oil, or olive oil adulterated with some other kind are no good, and Norwegian and Portuguese sardines, while they are pleasant enough, ought to have another name altogether, so different are they from that lovely shining, pink two-mouthful-morsel the real French "sardine a l'huile."

And then, fresh from the sea and grilled in butter! That is something that you must go to Douarnenez to discover. I have never had anything like it, not even brook trout or Dover sole, be they ever so marvelously cooked.

Fish is so plentiful in these parts that in the contract drawn in engaging domestic help there was a clause stipulating that fish should not be the dinner dish in excess of twice a week.

It is a lovely sight when standing at the end of the jetty in the afternoon to watch these boats pass in groups of two and threes. Leaving the calm of the harbor under the impetus of a gentle breeze from the land, then keeling over in seeming surprise as the stronger wind strikes them immediately they are a few yards outside the shelter of the lighthouse breakwater, and riding out into the Bay of Douarnenez spreading out like an enormous fan till they become little dots on the horizon.

There they will stay, till you have spent your night in bed, and by the time you are about again at the quay side in the morning, you will find them all riding at anchor, and thousands upon thousands of fish coming ashore in baskets.

Eight hundred mastheads each carrying a magic veil of fairy blue. These are the nets hung out to dry.

For the sardine is shy and crafty. Therefore the nets must be this lovely blue color, so that it may be almost invisible when lowered into the sea.

Then it must be very fine and very strong, fine for the best fish are small, strong, for the catch is heavy. And these qualities make a net a costly thing, and mending them a necessary and delicate art.

As you pass down the streets you will find two high poles

erected in the yards of the houses. Stretched between them bright blue nets, looking like giant fairy cobwebs, while behind them young girls in the picturesque local costume, looking like multicolored flies, throwing their shuttles back and forth with bewildering rapidity and skill.

It is a great unhappiness to me that I broke all my Douarnenez pictures, and sold my motion picture film, so of this place I have no personal record, and this is curious because it is almost my favorite spot in Brittany, in spite of the continual smell of fish, and the early morning clatter, clatter, clatter of the clogs as the sardine girls march off to the factory.

At the hotel here I used to wait for lunch each day for my grilled sardines, for they were a gastronomic novelty to me, and I did not want to invoke the contract restricting their frequency.

By the time you have traveled about this far in France you will discover that if you get more than one knife and fork to go through dinner (and of course in France there are always several courses,) then you are in an hotel of the "premiere classe," but if only one knife which must be wiped off on your napkin between each course, then you have landed yourself in a place of the "seconde classe" and as I mentioned in a previous chapter, if you are staying over night there the napkin may be laid away in a pigeonhole for the next meal or next day!

In many station restaurants they are very practical, for on entering you will see long tables already set for the arrivals, or for local diners, and standing high above the tables in clear view, cards saying:—"1 franc 50"—"2 francs"—"2 francs 50"—meaning that if you sit at one of these tables you thereby indicate without waste of time or words that you desire the table d'hote dinner at the price displayed on the card. Therefore everything is brought to you without orders or delay.

No waste of waiter's time or your breath, you sit down and eat what he brings, including naturally, "vin ordinaire," of which a bottle is put at each "cover" place.

Now here again is where the French combine their business sense with "psychologie," for we all are snobs at heart, or we want to look like good sports, and certainly not be regarded for the rest of the trip as pikers, so the result is that many a man with a fifty cent pocket book will sit at the dollar table. Especially if his wife is traveling with him, or he has found a kindred feminine soul en route!

Food varies quite widely, for there is bad food in France, and as to coffee! ONLY in America can you consistently get good coffee, in France it is too awful, in England I must look for a word in the dictionary to describe it, though it is not so awful as in France, and they do make splendid tea, to balance things, but in France the coffee is appalling and the tea is worse. That is why they drink wine!

Generally the food quality varies in the inverse ratio to its cost. In Morlaix where it was dear, though I will not specify the hotel where I stayed, but it happened to be one with several courses and one knife and fork, it was very poor. In Paimpol where it was really expensive it was very bad indeed, and I do regret this because the hostess and sister were quite the reverse, and I really mean, quite the reverse; while at the Ile de Brehat and Lannion where it was cheap, it was perfection.

You find more curious people and characters in the smaller hotels of France than any places I know, odd people, and what we call "Dickens" characters.

I came upon one man at several places, with a pretty daughter, and it did not matter to him how many or how few "table tools" they supplied, for he used his own.

He would use the hotel spoons and forks, but never their knives. He would dive into his trouser pocket and take out a clasp knife, he would open the smallest blade, which from the look of it had a razor sharp edge on it, and with this he would carve everything, carefully cleaning the blade on his napkin between each course, and then stropping it on the palm of his hand. He had odd table ways of eating, too. He was furtive and suspicious about it, he would get a sufficient pile on the fork, lean very close over the plate, bring the load fairly near his lips, and then with a sort of vacuum cleanser indrawn breath whisk the more than mouthful in, then he would raise his head slightly and look quickly round as though to say: "Well, I got that in before any of you could stop me."

The only course for which he did not use the pocket knife was the soup. This he shot into his mouth from the pointed end of the spoon, with many sounds of deep appreciation, and when the spoon failed to get the last few drops, he lifted up his plate and poured the remainder down his throat.

With the gravy on his plate he was also un-wasteful for he chased it round with a bit of absorbent bread, "dunking" I think it is called by some over here, and left the plate polished.

He had an odd way with the fish, for when the waiter went round with the dish on which was one nice little fish for each diner at the table, he took his famous knife, and cut two fish in halves, and took the head end of each leaving two tails for someone else. Yet I found after that this was not mere desire for the thicker and better end of them, it was the **heads** he was really after, for after he had finished all that you or I would eat, he sucked these dry with great approval.

To add to his peculiarities he had a mild St. Vitus dance, which caused him to appear to nod his head after each mouthful had reached its destination as though to express his satisfaction.

He never raised his head except between courses and then just enough to shake down the last and make room for the next, and then his eyes would pop out as though in mild surprise at his own shocking behaviour.

With the "petits pois" he was a conjurer. He would poise a pile on the convex side of the fork, he would hold this about two inches from his mouth, and as it were with one movement he would blow out his breath to cool the peas, then draw in his breath, and a stream of them would be suctioned up into his mouth.

He ate **all** the chicken course, white meat, dark meat, and followed these with the bones, all of them! (Ripley—Believe it or not.)

And all the time he had a curious jaw movement, a little like toothless old men, down-out-up; down-out-up. One-two-three-one-two-three—waltz time, and all he needed was an orchestra playing the "Blue Danube."

Yet otherwise he was quite a normal person, very pleasant, and I think I mentioned before that I met him at several places where he and his daughter, his very pretty daughter, appeared to have chosen the same time for visiting. Looking at her fair face I soon got to ignore his funny ways.

One of Brittany's interesting historical legends attaches itself to Douarnenez, for there was once a king there named Marc'h who loved a lady called Yseult, but Marc'h had the ears of a horse instead of normal ones. He managed to keep his secret by hiding his ears under caps, and having all barbers who had to be called in to cut his beard or hair killed immediately after they had attended to his beauty culture. Unfortunately he allowed his better feelings to make him merciful

in one case, and he spared the life of one barber after swearing him to secrecy. The barber did not tell anyone, but the secret so preyed upon him, that he went down to the shore and told it to the river where it joins the sea. Some young reeds were just pushing their way up, and caught the words. Later a poet musician cut the full grown reeds and made a musical instrument, but the only sound he could produce from them was the song they had heard in infancy; "Marc'h le Roi de Plomarc'h a des oreilles de cheval" so naturally the poor king lost his girl, and she went off with Knight Trystan de Leonais who lived on the Ile de Trystan, close by. This shows the folly of letting people out "on parole." Dead men tell no tales.

Locronan, about ten kilometers from Douarnenez inland is really a place of importance as far as tourists are concerned, for here is an important "Pardon" and much that is picturesque.

The Saint commemorated is St. Ronan, and the day to be there is the second Sunday in July. But if you are lucky enough to be there at one of the celebrations which occur once every six years then there will be "doings" for a week that will be remembered always. This sixth year celebration is called "La Grande-Tromenie."

St. Ronan died in a forest somewhere near the conjunction of three Bishop's dioceses, and in order to decide to which Diocese the body should belong the Bishops of Vannes, Cornouailles, and de Leon rode in a chariot drawn by two wild bulls. The bulls encircled the mountain side and came to a stop at the exact place where St. Ronan died. At least the Bishops so decided, and there the tomb was erected. This was at Locronan. Every sixth year the route of the original pilgrimage is followed by a huge procession and a cart drawn by two bulls. Short services being held en route and singing all the way. During this time something like forty thousand persons will visit his tomb.

The costumes here are again very gay in coloring and extremely picturesque. I bought the one worn by the young girl in the picture. It is now in my possession, and after being made about a hundred and fifty years ago is still in very fair condition and the silver braid with which it is covered just as bright as when new.

Several generations have used it as a marriage gown, and it has decked the form of all its successive owners at many fetes and "Pardons."

Much of the heavy and delicate embroidery on these gowns is done by the girl's sailor sweethearts! Capacity to deftly wield an embroidery needle is not there regarded as abnormal in a man. Imagine trying to get away with such a favorite indoor sport in this country!

The modern equivalent of this costume is shown in the group of three young married women, but while it is effective it is but a pale shadow of the older dresses.

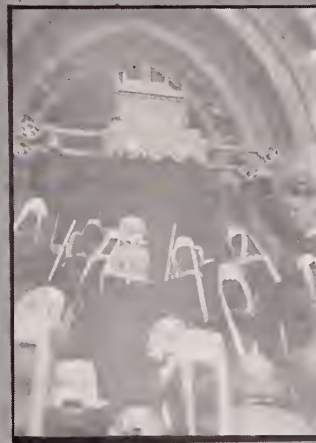
Quimper is a name probably far more familiar to people the world over than almost any name in Brittany, because some enterprising person has put its chief product on the world market, and in America during the last few years a great quantity has been on sale.

This is the Quimper china ware, teapots, cups, saucers, plates, and many smaller things being in most of the art shops of America, and to be bought at fairly reasonable prices.

The decorations generally include a Breton in "Bragou-bras" and some of the shapes are quaint and ingenious. The tea-pot I brought back with me is effective even though not so practical when you try to wash the leaves out.

This is the city of bridges, and is said to be the most "breton" of all Bretagne, and in old times was looked upon as a sort of "joke-town" as one in New York jokes one who lives in, or goes to Brooklyn. La Fontaine, the poet, wrote of this:

(Continued on Page 41)



Left to right, starting at top: 1, It's not war, it's Heaven! 2, Part of procession at Locronan. 3, Passing under the relic of St. Ronan. 4, Crowd at Locronan, velvet jackets and all. 5, Douarnenez. 6, A Locronan bride. 7, Young married women. 8, Girl in old-fashioned cap.

PATH OF RAYS THROUGH MICROSCOPE AND CAMERA

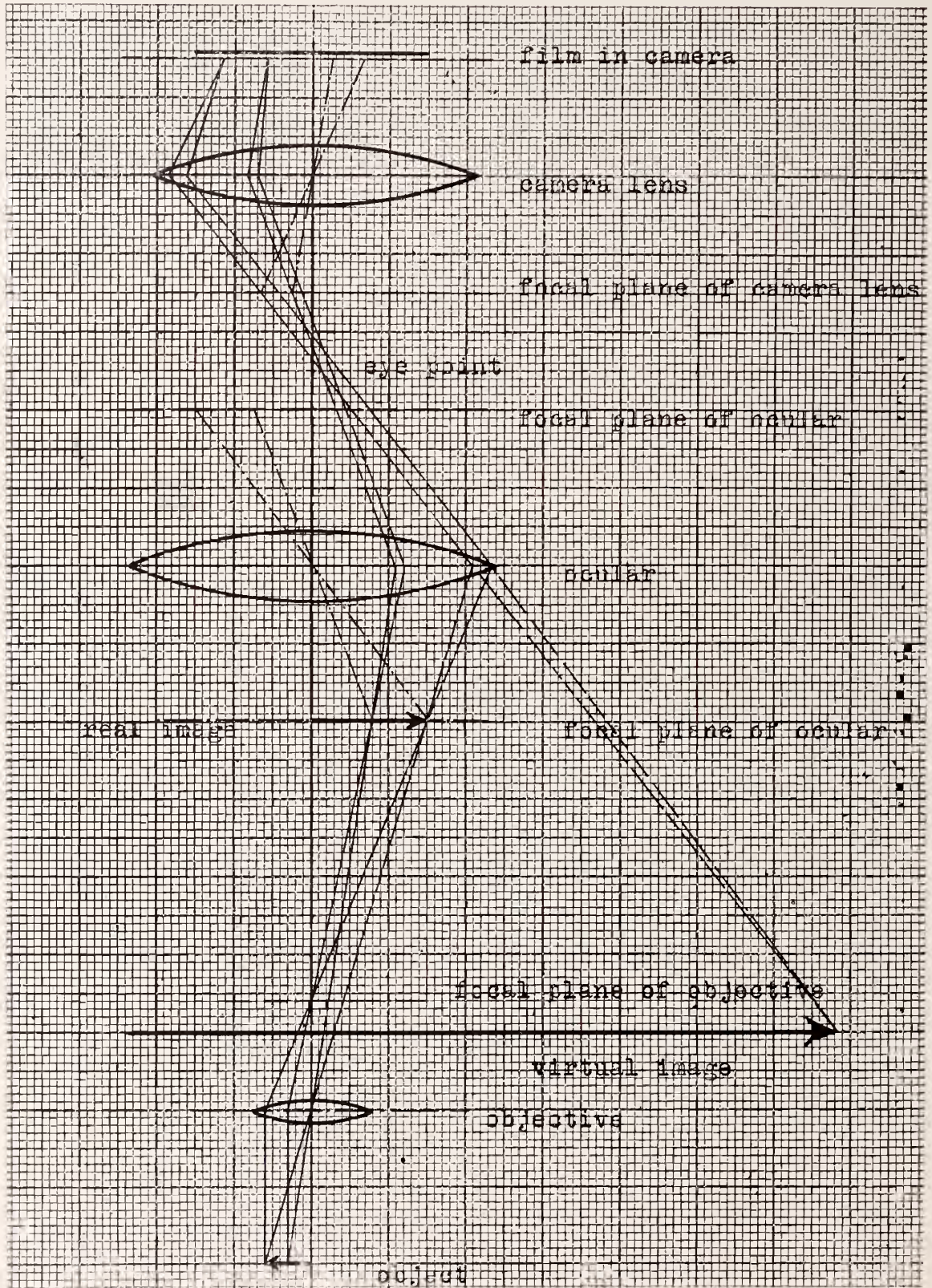


Fig. 6

Cinemicrography with the 16 mm. Camera

by **JOHN C. FARDON**

Basic Science Research Laboratory, University of Cincinnati

THE MOTION picture camera has long been an essential instrument in the scientific laboratory for the recording of experiments and the analyses of objects in motion. Before the advent of the 16 mm. camera it was not always within the reach of the smaller laboratories and individual research workers to obtain the standard camera with its costly film maintenance. Furthermore a camera of the 35 mm. type had its disadvantages insofar as it was rather difficult to manipulate under the conditions of certain experiments on



Fig. 1

account of its size. The modern 16 mm. camera is ideal in the respect that it is light in weight, compact, flexible, and within reach of most investigators. In this laboratory the Bell and Howell 70-D camera is being used to good advantage in recording and following feeding experiments on animals, making records of instrument set-ups, and the photography of microscopic objects. Fig. 1 shows the 70-D mounted with the Badgley automatic dissolve and the effect-box. The adjustable mounting and effect-box were constructed in the laboratory. By double exposure and with the aid of the effect-box, with the proper masks, it becomes but a simple matter to record a series of experiments such as the comparison of a set of animals subjected to abnormal conditions to a set of controls. The applicability of the camera is obviously numerous and too well known to give further mention here.

It is the purpose of this article to describe some minor modifications and developments made in cinemicrography in conjunction

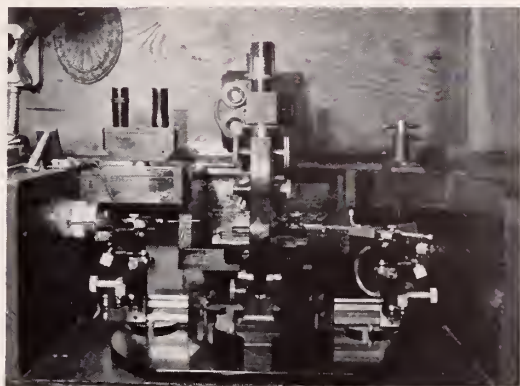


Fig. 2

with investigations on the adaptation of protozoa to abnormal environments.

Fig. 2 shows the general set-up of microscope micromanipulator, and camera. A special body tube has been constructed (Continued on Page 40)

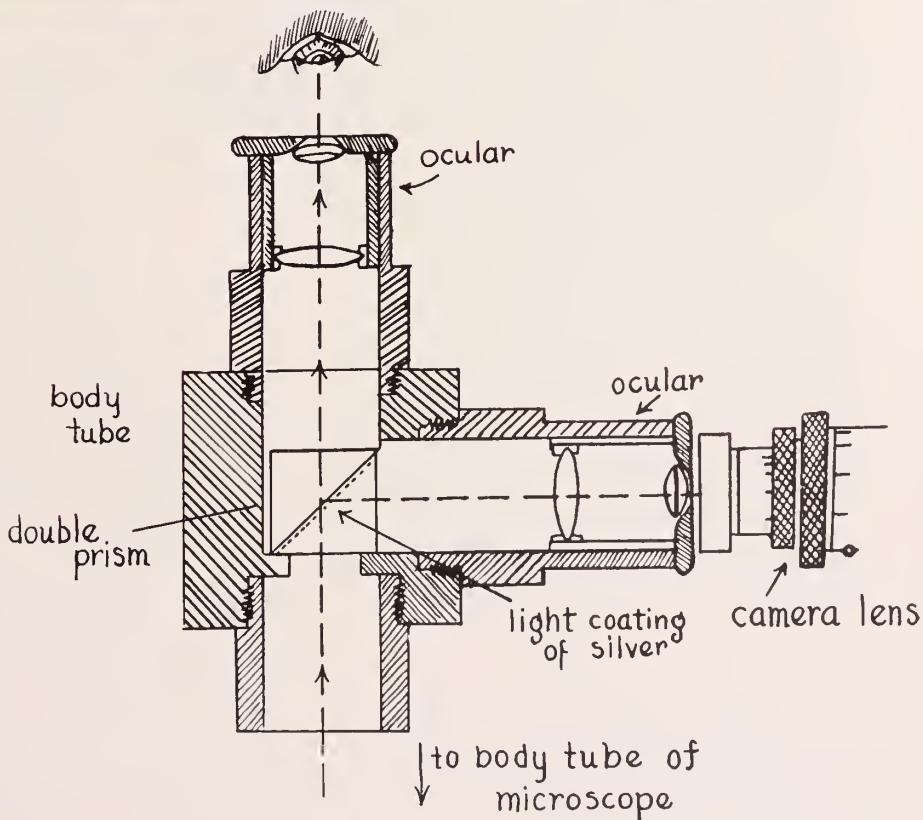
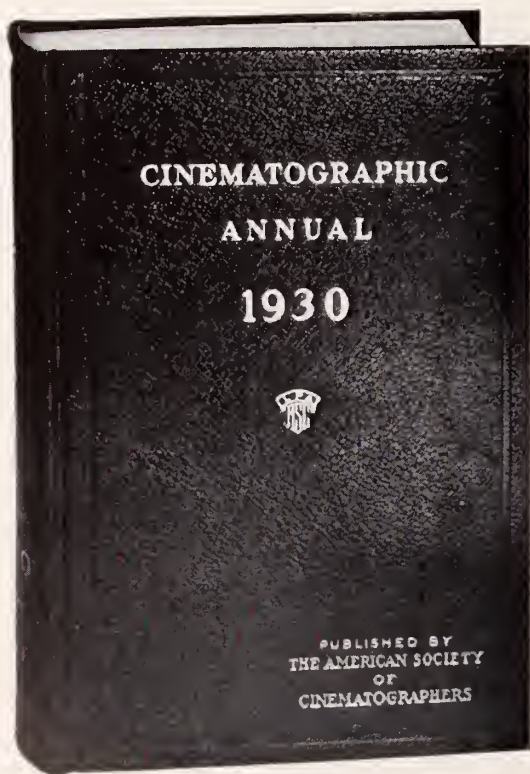


Fig. 3

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(Continued from Page 31)

and makes a dash for it. She never stops being curious about the camera, and wanting to know all about it. I really don't know just what to do about it, for we really want pictures of her now, and yet—how can we get them? Hal Mohr suggested that we try a longer-focus lens the other day; I think we'll try it, for if we could get the camera farther away from her, it is so quiet that maybe she wouldn't hear it.

"There's no doubt about who the baby's favorite movie-actress is, though—it's herself! Any other pictures bore her stiff; but as soon as she sees herself come onto the screen, she excitedly tells us 'There's Jane-ee!' and is perfectly happy.

"Outside of these films—which are just like those that every family makes—we haven't done anything very startling, I'm afraid. We made a complete record of the progress of our new home, from the time it was simply a vacant lot that didn't even belong to us, up to the time that the house was finished, and we moved in. Then another time, when Mary Astor and I were working in 'Holiday,' we made a special 16mm. silent version of the film for ourselves. We both brought our Filmos to the studio, and we would set one or the other of them up by the big camera, and then we'd get the scene at the last rehearsal—just before the real "take" of the scene. No chance for even a Filmo when they're recording, you know! It worked out very nicely, for when Mary was in a scene I would run the camera, and when I was in the scene, she would run it; and if both of us were working, there would always be some member of the company who would be glad to press the button for us. I've been intending to try the same thing on some of my other pictures, but since then I've been so busy that I've had no chance to do so. I did bring my Filmo to the studio the other day, though, and I'm afraid that I've started the director, Richard Milton, on the downward path, for he was so interested in the little camera that I had a hard time getting it home again!

"Since my husband and I bought our airplane, we've been planning to try and see what we could get with the Filmo from the air. Our machine is a closed one, you know, and it should be ideal for photography. But thus far, we've both been so busy that we've not been able to try it. Perhaps it's just as well, for I know I ought to learn a lot more about color-filters and such things before I do any aerial photography. I want to try some Kodacolor from the air, too, for half the beauty of flying comes from the different color-effects that we see up there.

"But when we do try these things, I'll have to be on the job more fully than I was when we flew East to get our plane, for I had carefully packed my camera, and made plans to bring home some wonderful scenes of our trip, and the new plane, and all that—and when I came to take my first scene, I discovered that I had very carefully left all my film at home! All through the trip back we saw things that we wanted to photograph, and at every stop we also quite forgot about getting ourselves some film; so all that I had for my pains was the privilege of flying my Filmo across the continent—and then flying it back again! My standing as the photographic expert of the Bannister family took quite a drop then—and it hasn't completely recovered yet.

"Another thing that has given me a lot of pleasure is experimenting with self-portraiture with my Filmo. I set the camera up on the tripod, and try to plan my picture so that when I am in place I will have an attractive composition. Then I start the camera running, and step around into the picture. It isn't so easy, for you can't, of course, be absolutely sure that you are in the right position. There's a great difference between arranging a picture with people that you can see through the finder and arranging a composition by imagination! When I first tried it, the results were really pitiful; my ideas of composition were none too brilliant, and I myself was as awkward and camera-conscious as any schoolgirl. And yet,



Miss Harding and her Filmo. The gentleman is Director Robert Milton

I've never been the least bit camera-conscious in any of my work at the studio. I suppose it's because I know that, in the studio, the photography is always in the hands of some supremely competent man like Hal Mohr, while at home, when I'm doing the photography, I know it's in the hands of a supremely incompetent novice! Still, thanks to the help that all the cameramen have gladly given me, I'm becoming less of a novice. You know, when I first entered pictures, I was rather afraid of the cameramen, for I had heard that they were a terribly clannish, upstage lot, bristling with professional secrets and haughtily disdainful of newcomers and amateur photographers. What a relief it was when I found out what charming, friendly people they really were! All of the men that I have worked with—Hal Mohr, John Seitz, Norbert Brodin, and many others, including their second cinematographers and assistants—have been more than willing to help me, both in my professional work and in my amateur work with the Filmo. Many of them, I find, use 16mm. cameras themselves, and, whether they do or not, they have been more than willing to help me with my little problems. They've often gone quite out of their way to explain things to me, and to show me how to make my films better. I've a lot to learn yet, but with their help I don't see how I can help learning. But please don't say that I'm a good photographer, for I'm not—yet."

Perhaps Miss Harding isn't a good photographer—but, I have never yet met a real novice who would admit the fact, nor an expert who claimed to be one.

Newsreel In Color Planned By Paramount

PARAMOUNT will eventually issue a newsreel in color, Emanuel Cohen announced recently. Materialization of this intention, he pointed out, is contingent upon laboratory speed in getting out release prints and also their cost.



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Cinemicrography

(Continued from Page 37)

to fit the tube of Bausch and Lomb CBE microscope. As shown in fig. 3, the usual method is used to split the light in two directions with a double prism. One of the 45° prisms was coated with a thin film of silver and then cemented to the other with Canada balsam. As shown in the figure the prism is so mounted that the greater percentage of light received from the objective is reflected to the ocular facing the camera lens, the lesser amount to the eye. It has been found that very good exposure and definition can be obtained by leaving the lens in the camera since the rays of light upon emerging from the ocular are so nearly parallel that when the camera lens is set for infinity the object being observed with the eyes is also focused sharply on the film emulsion. Fig. 6 shows a diagram of the path of the light rays through the microscope and camera lens. All pictures made thus far have been with the F-1:8 and F1:5 one-inch lenses, the lens hood of the camera nearly touching the ocular of the microscope.

An ordinary automobile 50 c. p. lamp is used as a source of illumination with a condenser for collecting the light. Sufficient illumination can be obtained by this method when

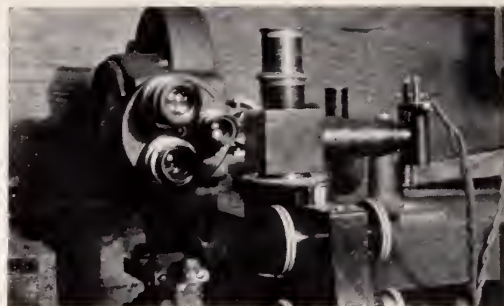


Fig. 4

using oil immersion and a magnification of 1800 x, the camera speed at 16 frames per second.

On some deeply stained slides it is necessary to bring the voltage a little over that at which the lamp is rated. But then with inanimate objects the camera can be operated at half speed.

For the determination of the correct exposure a thermopile is used (obviously the photoelectric cell or selenium cell will answer the same purpose). Fig. 4 shows the thermopile (in this case the Adam Hilger 10 junction thermopile used in their infra-red spectrometer) in its light-tight housing. When having the object on the slide properly centered under the objective, the ocular opposite the camera lens is removed and the thermopile inserted in its place. Readings are then taken with the galvanometer (which should have a sensitivity of about 1x10-7 amperes) and the illumination so adjusted until the desired setting is obtained. It is naturally necessary to first calibrate the light sensitive cell by trial exposures and making a record of the galvanometer reading.



Fig. 5

In fig. 5 may be seen three microphotographs taken by the methods described above. Referring to the figure; a, is a shot from unstained encysted protozoa; b, a stained section of a portion of the grasshopper testis showing the deeply stained chromosomes; and c, living protozoa. A magnification of 860 x being used on all three preparations.

Babbling About Brittany

(Continued from Page 34)

"C'etait a la campagne,
Pres d'un certain canton do Basse-Bretagne,
Appele Quimper-Corentin.
On sait assez que le Destin
Adresse la les gens quand il veut qu'on enrage
'Dieu vous preserve du voyage'."

Through the center of the city runs the river Odet. On the one side shops and a good street, then the river, and on the other bank lovely gardens and houses, and as there is no street on that side, every house has to have a private bridge across the river to the front gate, so there is a bridge every hundred feet or so. Very delightful.

The streets are old fashioned and full of wooden beamed houses, and the cathedral towers over all with its twin spires making it very impressive.

It was in the cathedral here that I saw for the first and probably the last time a priest conducting some simple evening service in the cathedral in a side chapel, and from under his cassock peeped the high black boots and spurs of a French army officer.

In my picture of the street and cathedral there is one spire showing, but another just like it is lurking behind the tall shop buildings on the right. It was a case of miss the lovely old house on the left middle foreground and catch both spires, or get the house and miss one spire. So I chose the house, because after all the other spire is just like the one you see!

The river in addition to running through the city at good breadth has several little tributaries which come bubbling through at right angles to it, and run in between the houses on their way making a miniature Venice of some side streets.

When you are here you must make a trip to the strangest people in Brittany, whose origin is entirely unknown, and whose facial characteristics are different to all other Bretons.

The people of Pont l'Abbe. Wide face, high cheek bones, almond slanting eyes, and dresses massed with strange orange colored embroidery. Keeping to themselves, marrying within their own people. Where they came from and when, has, as far as I can find out, never been definitely settled. They are certainly not Celts as the rest are. They almost certainly are some sort of Oriental. They are called "Bigoudens" which word describes the peculiar little cap and strange coiffure of the women. The hair is dragged up very tight at the back and stuck under the curious little conical cap. Their hips are padded out tremendously, and a skirt of many pleatings goes over this and sweeps voluminously round them. On Pardon days you get a good view of the back of these dresses in the overflow of worshippers crowding round the main door of the Church.

I almost forgot to say why the old woman at Locronan was laughing so. Her husband had just gone to war, and she had been advised that she would receive a weekly allowance from the Government during his absence. She was astonished and delighted: "What," cried she to the official who made the first payment, "fifteen francs a week, and no husband, it isn't war, it's heaven."

(I am not sure of the exact amount paid by the Government to soldiers' wives, so used "fifteen francs" as an arbitrary amount.)

Ira Morgan

IRA H. MORGAN, better known as "Joe," has been engaged by Walter Futter to photograph a number of subjects for "Curiosities." Morgan will be remembered for his remarkable photography of "When Knighthood Was in Flower" and "Never the Twain Shall Meet."

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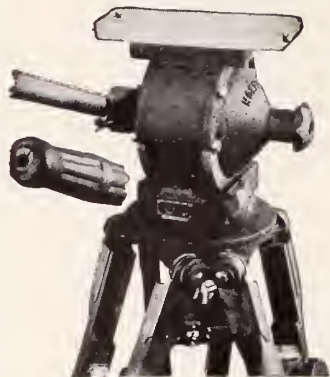
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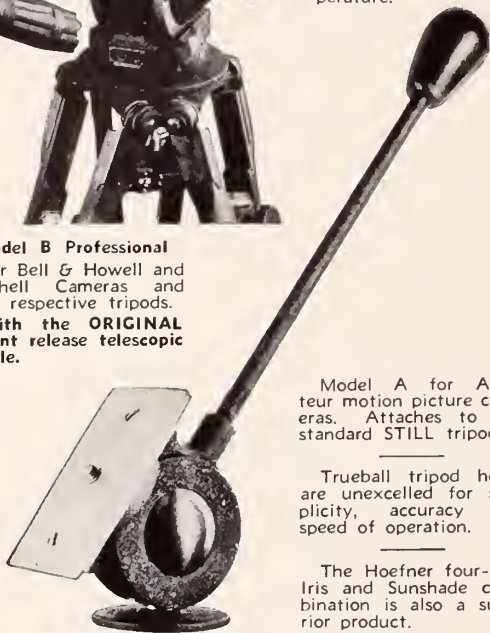
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New Eastman Projector

THE KODASCOPE, Model K, a projector announced as giving a quality of projection surpassing anything previously seen in the 16mm. field and with a cooling system so efficient that even after hours of running the lamp house is barely warm to the touch, makes its appearance before the home movie public this month.

The new projector appears as a companion machine, in compactness and efficiency, to the Cine-Kodak, Model K, the newest Eastman motion picture camera. Simplicity of operation is likewise an outstanding element in the new Kodascope, with operating controls grouped on a panel and with most of the important bearings oiled from a central point.

The secret of the screen brilliance produced by the Kodascope, Model K, is said to lie in a new and improved optical system. The illumination, provided by a special 260-watt lamp, is direct, rather than by reflection, and the available light is further conserved by light-trapping of the lamp house in a way permitting but a minimum of stray light to leak into the room during projection. The latter feature adds to the darkness of the room—a condition especially valuable in Kodacolor projection—as well as adding to the amount of light reaching the screen.

An attachment for plugging-in a floor lamp or a table lamp to the projector so that the room light goes on when the projector is turned off is an innovation of the "K" Kodascope, an innovation designed to eliminate fumbling around in the dark at the end of a reel and to assure that the room becomes dark promptly when the picture starts. The ammeter which is standard equipment on the new projector is indirectly illuminated, like the instrument board of a fine automobile.

The motor rewinds the film at high speed. Another unique feature is a rewind release and brake that assures solid winding of the film on the reel.

Kodascope "K" is supplied with a two-inch lens for maximum black and white brilliancy. Lenses of various focal lengths for both Kodacolor and black and white pictures are available as extra equipment. They are instantly interchangeable with the regular lens.

The lamp can be replaced, and the optical parts can be cleaned, very simply by opening a hinged door to the lamp house. The design of the reel arms prevents the driving belts from leaving the pulleys when the arms are folded down. The latter feature contributes to the freedom from adjustment with which the projector can be put into use.

Filmo Topics

THE August issue of "Filmo Topics," the interesting monthly magazine published by the Bell & Howell Company, holds much of interest for the amateur cinematographer. A copy will be mailed free if you write to the Bell & Howell Company, 1848 Larchmont Ave., Chicago, Ill. The table of contents for August follows:

"Using the New Film"—Article by R. Fawn Mitchell on the new supersensitive panchromatic film.

"A Trip to Europe Every Week"—How three clergymen recorded their 20,000 mile journey in films that paid for themselves.

Contributors Page—What amateur cinematographers are doing along the line of the unusual, and how they're doing it.

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Questions and Answers.



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Four Musketeers

(Continued from Page 21)

of the tropical sunlight usually demanded a considerable decrease in exposure, the dark greens of the jungle backgrounds, on the other hand, demanded a sharp increase in exposure. But, for the most part, their questions were surprisingly intelligent, and I was at times hard pressed to answer them properly.

After India, our trip was almost over; a long but delightful voyage up the Red Sea and across the Mediterranean to Italy, and we were back on the beaten track again. Then separation of our merry quartette; a few days of Paris, and home again, for me. But, after all the wonders I had seen, probably the greatest was the view of that little island of Manhattan as we sailed up the bay, for nowhere else is there such a thrilling sight as the terrific towers of New York.

Back in Hollywood and the familiar routine of the studios again, four wonderful months from the day I left. Homecoming is always the best part of such a trip—homecoming, and the memories one has stored up. I am glad that I've been able to make it possible for us to live the trip over again on the screen; I'd like, too, to be able to live it over again in actuality. But I'd hesitate a long time before taking such a trip again, for never again could I hope to find such wonderful travelling companions as Doug and his three merry musketeers.

Amateur Movie Making

(Continued from Page 30)

hard to find; but the amateur producer must be content to walk before he runs: he cannot expect to produce bigger and better pictures before he and his group have learned to produce smaller and simpler ones. Therefore, the first efforts of any group should be to produce some absurdly simple thing well. The rest will come with experience. There are scores of suitably simple stories already put in continuity form in the several home-scenario books available. But if you don't care to use one of these, it is really quite simple to write your own continuity. The first step is to select a plot. Then build your story around the plot, sketching in the action and the characterization. Then from this framework, evolve your basic long-shots: imagine that you can only use long-shots, and tell your story in them. In these basic scenes, carefully detail all the "business" that each character must do. Then consider this "business," and decide which bits of the action require further explanation: explain these in closer shots—medium shots or close-ups as the case may be—and, presto! there you have your continuity, quite painlessly.

Spiral Control Saves Light

EMBRACING new features which have completely overcome the "shadow and smudge" tendencies to be found in the ordinary product, Lakin Corporation has introduced to the industry a new spiral sleeve ring control which according to its evergrowing popularity seems destined to be a permanent appliance on modern incandescent lighting equipment, at least in a number of our best known studios.

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Tiffany, Tec-Art and R-K-O studios, all of whom are employing the new Laco lighting control in conjunction with Laco Lites are not hesitant in saying that it is a boon to the electrician as well as to the cinematographer.

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**Government Fosters Use of Movies for
Teaching Agriculture**

THE DIFFICULTY of obtaining really suitable film in satisfactory volume, which has constituted an obstacle to the more general use of motion pictures in certain phases of educational work, does not prevail in the field of agriculture, according to a report just issued by the Educational Division of the Bell & Howell Company.

For many years agricultural machinery manufacturers have been telling their story with movies, and the U. S. Department of Agriculture has long recognized the teaching power of the film as a dynamic supplement to other means of education, according to the report. The Department's Office of Motion Pictures, with a force of 23 permanent employes and a budget in 1930 of \$87,729, has developed a service that last year circulated over 10,000 reels of film, supplied on a free loan basis, for an estimated audience of three and one-half million, we are informed.

Says the report:

"Mention should also be made for another audience, probably equal in size, comprising the teachers and students of schools in this country and abroad which have purchased the Department's films. Last year 419 films were sold to schools in this country and 255 abroad. From the Argentine to the Union of Soviet Republics, U. S. Department of Agriculture films are serving the needs of farmer and teacher.

"Early last year a beginning was made in the preparation of films of the newer 16 mm. safety type. Twenty such films were made available as a start, with some misgivings as to whether the demand would be large enough to warrant the enlargement of this service. A year later one of the men in charge wrote: 'Schools seem very anxious to get 16 mm. films, and if our (loan) service were extended to schools we would, doubtless, be swamped with requests for films.'

"The budget of the Office of Motion Pictures is so limited that it has hardly been able to take care of the loan demands from its principal field of activity, the county agricultural agents. Over a thousand requests had to be left unfilled for lack of films last year. However, 16 mm. prints of any Department of Agriculture films may be purchased at the extremely low price of two and one-half cents per foot, or \$10 per 400-foot reel. Various state university extension divisions have purchased these films and are making them available to schools under their jurisdiction, and the tendency in this direction is growing rapidly.

"The advent of sound, according to the director of the Department's extension service, has resulted in a temporary drop in demand for films and a falling off of total attendance. An experimental recording laboratory has been set up, and the Department's new educational pictures are being so prepared that an accompaniment of sound may easily be added later. It is reported that work is now in progress on three sound-on-disc recordings. One sound-on-disc film subject on 'Sage Making' has already been prepared. The Director of the extension service states: 'The budget and facilities of the office are based on past needs for silent pictures and are wholly inadequate for the installation of sound equipment and the much greater cost of the production of sound pictures.' It is expected that funds will be made available both for the production of the most modern type of material, and for its distribution where the greatest demand and need exist—the school field.

"The department does not contemplate the free loan distribution of sound-on-disc subjects. However, as fast as the subjects now in preparation are finished, 16 mm. sound-on-disc versions will be offered for sale at very reasonable prices. Subjects now under work include: 'Forest and Wasteland,' 'Forest and Water,' and 'The Indian Sign Language.'"

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Kino-Plasmat f:1.5 . . . 15mm. focal length

CONSIDERED in its application to the new Supersensitive Film, Hugo Meyer's announcement of a new addition to the Kino Plasmat Family of Lenses, namely the f:1.5 15mm. Lens, is particularly interesting. This lens combines unusual speed with wide angle properties. With this combination, that is film and lens, it should be remarkably simple to shoot all sorts of indoor and outdoor scenes, even under very poor light conditions.

In its corrections and optical construction, this lens is a true Kino-Plasmat—corrected for the primary colors of the spectrum and affording a true-to-life rendition of the subject. The corrections of this particular lens afford extremely sharp definition even when wide open.

Its unique combination of extreme speed and wide angle properties will enable the cinematographer to take indoor shots of objects comprising a very wide field of view at extraordinary close range. It should prove ideal for cramped interiors and for extended views. This lens takes in approximately a 60% wider field than the 1-inch lens.

In addition to the Plasmat's characteristically improved depth of focus, the extreme short focus of this 15mm. lens assures sharp definition even when the operator is careless in gauging his distance or setting the focusing scale.

The lens is in a focusing mount calibrated from 1½ ft. to Infinity. Like all Kino Plasmat's it is suitable for work under all conditions, indoors or outdoors. In brightest sunlight, it can be used at the smaller stops with complete satisfaction assured. The speed of this lens is sufficiently high to permit the use of a 5X filter.

It is not necessary to remove this lens from the turret when revolving the latter.

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New Firm Enters Sound-On Film Field

COMPRISED of men long established in the motion picture industry, with experience qualifying them to meet the most exacting demands of modern production, General Sound Corporation, Limited, has entered the field offering "the ultimate in sound-on-film recording." With up-to-date laboratory and offices at 5360 Melrose avenue, the new concern plans to offer the best in sound-on-film recording.

Charles Piper, well known laboratory technician and cinematographer, is president of the firm, while Frank P. Arrousez, inventor and patentor of Laco incandescent lighting equipment and one of the industry's best known electrical authorities, is vice president and general manager. Bert Bates with years of association in the enterprise has been made secretary and treasurer.

B. J. Kroger, chief recorder for General Sound Corporation, was at one time affiliated with Photophone and Fox Corporation. He has to his credit the sound recording of many outstanding film productions. The new sound organization recently completed the recording for Pioneer Pictures first feature length Multicolor production, "Yesterday in Santa Fe" and will commence work shortly on a feature Western for Dick Kahn, after which they will record sound for the second Pioneer Pictures production, "Yellow Legs," to be begun early in August. Twenty six screen novelties to be produced by Jess Weil, also are to be recorded by this new concern.

According to Willis Kent of Tec-Art, General Sound Corporation, Limited, unquestionably offers excellent independent recording.

31 Victor National Branches In Operation

It was recently announced that the Wholesale Division of the National Theatre Supply Company had acquired exclusive rights to the wholesale distribution of Victor Cine-Cameras, Cine-Projectors and Animatophones for the entire United States.

The work of organizing non-theatrical departments in the 31 Branches of the National Theatre Supply Company to handle the sale and servicing of the Victor 16 mm. line has been practically completed, according to word received from A. M. Beatty, Wholesale Division, National Theatre Supply Company.

Mr. Beatty's entire time for the past three months has been given to the task of establishing these departments and securing the services of a personnel thoroughly qualified to satisfactorily handle all phases of the specialized work connected with 16 mm. sales and service. Personal supervision of all the details connected with the tremendous venture has made it necessary for Mr. Beatty to cover thousands of miles of territory and to visit every State in the Union.

E. L. Schroeder, Sales Manager of the Victor Animatograph Corporation, Davenport, Iowa, is making a series of visits to each of the 31 branches for the purpose of schooling the personnel and coordinating the work between the branch non-theatrical departments and the Victor Factory and Sales Organization.

Retail distributors of Victor products who have been contacted by the new factory service-sales branches are enthusiastic over the possibilities offered by the Victor-National marketing plan. Victor users are naturally pleased at the prospect of having expert service close at hand, should it ever be required.

Photophone Recording Unit Shipped to Gainsborough

R-C-A Photophone is shipping one of its Standard News Reel recording units to the Gainsborough Pictures studios in London and its first assignment will be with the Rex Ingram unit for the recording of exteriors in Africa which are to be included in a super-production now being made under Ingram's direction.

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FOR SALE OR RENT—Mitchell camera equipped for Sound. Al Gilks. HE-1490 or A. S. C. Office GR-4274.

FOR RENT—CAMERAS

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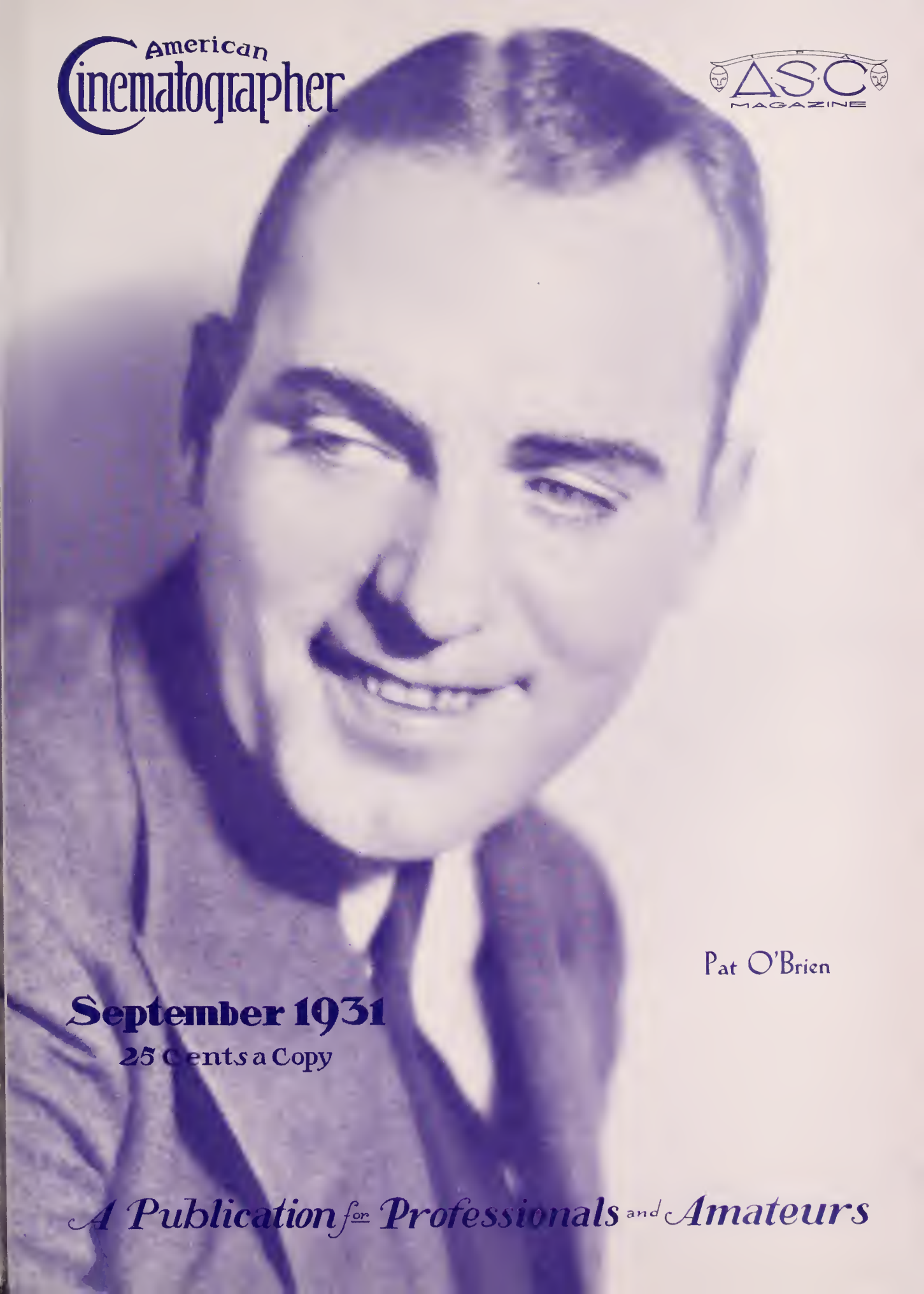
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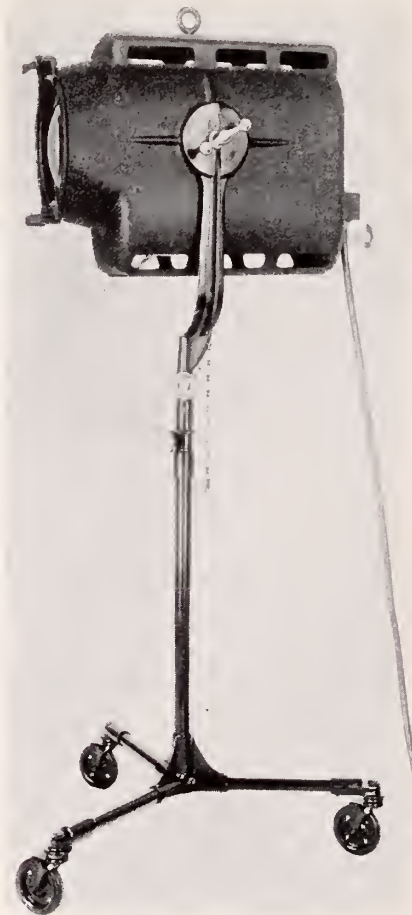
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Number 5

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HOLLYWOOD

KARL STRUSS, A.S.C.

Sound Pictures in the Solution of Solar Eclipse Problems

by **F. P. BRACKETT**

Pomona College, Claremont, Calif.

IN ALL strange and beautiful phenomena of nature, I suppose there is nothing as thrilling and spectacular as a total eclipse of the sun; and yet, strange to say, very few really successful motion pictures of a solar eclipse have been made.

This is probably due to the fact that motion picture men and astronomers did not cooperate in the effort until within the last two or three years. Several attempts to obtain such pictures failed because the cameraman did not follow the counsel of astronomers in meeting conditions entirely different from those with which they were acquainted. On the other hand, astronomers, with all their experience in photographing celestial objects of all sorts, could not make a **motion** picture of a solar eclipse without the assistance of experienced motion picture men and their instruments.

In 1923, astronomers flocked to California to observe a solar eclipse. In organizing an expedition from Pomona College, we conceived the idea of taking motion pictures which would furnish a complete graphic record of the eclipse for scientific study, and at the same time be of popular and commercial value as a motion picture. A scenario was written which included all the dramatic features incident to the preparations, the voyage to the station, and the activities of the observers during the eclipse, as well as views of the eclipse itself. An agreement was made with a motion picture company to "shoot" the pictures. When the time came, however, they decided "to go it alone," with the result that neither they nor we got the motion picture, though other parts of our work were successfully done.

During the past two or three years a number of good cinema-eclipse pictures have been made, one of them, by the way, on a winter morning in New York. In every instance this has been accomplished by the earnest cooperation of producers and astronomers. I believe that we have only started on the road to success in this field.

A total solar eclipse occurs when the moon intervenes between the earth and the sun, and its shadow falls upon the earth. From any point in the shadowed area of the earth, one sees the sun covered by the black disk of the moon, its light being blotted out. But if one were looking down upon the earth from the moon, he would see a dark oval-shaped shadow moving rapidly across the earth's surface.

If the shadow-spot were small enough he might even see it all from the summit of a high mountain or from an aeroplane. Accordingly, Dr. Whitney and I organized another expedition from Pomona College, at the time of the total solar eclipse in April, 1930, to obtain motion pictures of this shadow of the moon upon the earth from an aeroplane, and to locate the shadow and time its motion with the greatest possible accuracy.

The result of this undertaking, if successful, would be that we should be able, by locating and timing the shadow, to determine with new accuracy the moon's distance from the earth, and so the relative positions of earth, moon, and sun; and hence, among other things of much importance, to permit more accurate computation and prediction of eclipses.

Stated thus briefly, the problem looks simple enough, and is easily understood but it proved to be quite an undertaking, involving hundreds of people and elaborate equipment.

The eclipse of April 28, 1930, was very unusual, and because of this unusual character, it was ideal for our purpose. The eclipse was very short, totality lasting only 1½ seconds (the average duration of a total solar eclipse is two or three minutes), which was quite unfavorable for most observations. Its brevity was due to the fact that the shadow of the moon, cast by the sun, barely reached the surface of the earth, passing over a strip of a few hundred miles, and the shadow spot along this line was very small—only 2/3 of a mile across at its maximum.

It is a very curious circumstance that the size of the moon and its distances from the earth and the sun should be in just such a proportion that the length of the moon's shadow (the umbra) very closely approximates the distance of the moon from the earth, i. e., about 240,000 miles. It varies a few thousand miles in length, so that sometimes the earth is within the umbra and we see a total eclipse, and sometimes it is beyond the umbra (i. e., in the penumbra) and the eclipse is annular. It is still more curious and unique when these distances are so closely the same that the point of the cone-shadow just touches the earth's surface for so short a path and with so small a spot.

Computation indicated that if pictures were taken from a height of 12,000 to 15,000 feet above the ground this shadow-spot might be entirely contained in the frames of a motion picture with margin enough for identification of nearby objects.

Geometrically, of course, two points are needed to determine a straight line. Hence, to locate the central line of the path of totality (which for a few hundred miles is nearly straight) we required two well separated sets of positions of the shadow. This meant also that we required four stations, two on the ground and two in the air, two good motion picture cameras, and two powerful aeroplanes.

This is not the place to tell the long story of preparation—the preliminary computations, the study of lighting conditions, the investigating and testing of films, the securing of aeroplanes and cameras, the selection of stations, the building and adjustment of auxiliary instruments, the transportation to the stations and setting up of the instruments, the placing of a large pattern of identification marks over miles of desert floor—two or three months of intensive work.

In solving this problem not only the exact location of the shadow was needed, but the exact time of the spot-location for each separate picture. For this, very fortunately, we were able to use a method that would have been quite impossible during previous eclipses—that is, to use a sound-camera to record time signals on the film itself. Hence we had to provide either for an astronomical determination of time on the spot or for the broadcasting of time signals by an astronomical station, and this required a radio receiver in the aeroplane in addition to the camera.

To make a long story short, we established two regular ground stations—one at Ramm's Ranch, near Camptonville on the west side of the Sierra Nevada range in Yuba county, Calif., and the other nearly 100 miles distant, at Honey Lake, north of Reno, Nev., on the east side of the mountains. Motion picture cameras for the graphic record of the eclipse itself and

(Continued on Page 20)

Screen Definition

by **DR. L. M. DIETERICH**

Consulting Engineer

PART X

IN the foregoing articles the depth effect produced by the screen presentation of a motion picture has been considered from different points of view.

The ideal effect would be reached by endowing the screen picture with the main characteristics of natural vision, i. e.,

1. even definition throughout,
2. unlimited depth of focus; and
3. the simultaneous or within the limit of persistence of vision alternatingly projected series of simultaneously taken photographs, coupled by a parallaxic lens system; each of these couples to be impressed on one eye only.

This complete imitation of natural vision we call the stereoscopic effect.

It has been shown that such an effect is at the present state of the art in optics, photography and projection still a practically unsolved problem and that even theoretical science has so far been unable to suggest to the practical worker any feasible plan to accomplish this result.

There are, however, a number of practical possibilities which each, in themselves, increase the depth effect of the screen picture over that now shown on the screen.

The present screen picture has three visual characteristics producing a limited depth effect, which fluctuates with the skill of the cinematographer in accomplishing the best compromise between them.

The first compromise has to be reached between the focal length of the camera objective determining the maximum height and width of the field to be shown and the thereby established perspective.

Reducing the focal length increases the depth of focus and field size but increasingly distorts the perspective characteristics of natural vision.

The second compromise lies in the necessary illumination of the field.

Contrasty illumination increases depth by increasing definition, but also tends to produce an unnatural sharpness or harshness.

The outstanding cinematographer is the one who by knowledge and experience produces the best depth effect by the best solution of the complicated compromise between emulsion characteristics, lens stops, shutter control, illumination effects, and the careful spreading of definition.

The above mentioned different compromises materially affect the final depth effect which is, furthermore, enhanced by the direct and relative motion of one or more objects in the field.

These compromises encompass all of the at present available means to produce depth effects as far as the cinematographer is concerned.

There are, therefore, no means on hand to fully cover the three conditions enumerated above.

The Detrar lens, scientifically developed but so far not commercially introduced by the author results in photographs covering points 1 and 2, but still calls for a compromise between field size and perspective.

The Beach lens, known as multifocal lens and consisting of two concentric lenses of different focal value, also produces a marked increase of depth effect in portrait or still work with carefully placed objects, but has, to the knowledge of the author, so far not been developed for use in cinematography.

The endeavors to produce small parallaxic effects by oscillating or excentrically rotating lens systems have in some instances produced an increase of depth effects, based upon horizontally perceptible distortion results as previously explained in connection with the sight reactions produced by view through an uncorrected convex lens. These increases of depth effects, however, can be and are by their very nature not of sufficient value to warrant their independent practical application, but become of importance only when we consider them as an additive element to other means increasing depth effects.

Efforts in the direction of embossing negatives with minute cylindrical or even spherical lenses relate to this same group of distortion effects and again have independently only a small although beneficial influence upon depth of picture.

A gradual increase of this picture characteristic is also practically brought about by the continuous improvement in standard lens designs, mainly by increasing by more thorough computation methods on the improvement of definition for an increased focal depth, also enhanced by improved tonal color corrections.

A combination of these various improvements in depth effect, although individually rather small, would, in the opinion of the author, produce a marked improvement in screen effects.

So far as projection and screen characteristics are concerned, we have a second group of individual improvements, a practical combination of which in themselves and in further combination with above cited improvements, should produce a final screen effect, which although not truly stereoscopic, would probably be considered as such by the broad mass of spectators.

This second group shall be considered in the next article and the conclusions to be finally deducted from these analytical studies are intended to prove that at the present state of the art, truly stereoscopic screen effects for the unaided eye are not obtainable, but that a logical and harmonious combination of practical detail improvements, so far perfected, should enable the industry to approach natural vision effects to a far greater extent than now practiced.



Release-Prints

by JOHN ARNOLD

President, American Society of Cinematographers

AT A time like the present, two things are vitally necessary: to secure value received for every dollar spent in production, and to assure that there can be no possible flaw in any of the many details of production which would cause a picture to be less attractive to its ultimate purchasers, the public. Naturally, then, every department of the motion picture industry is striving to secure maximum efficiency in production, and maximum quality in its product. Studio efficiency has reached a very high point, and with it the quality—especially the technical quality—of the pictures produced.

There is, however, one phase of the situation which has been generally overlooked. This is the release-print situation. The quality of the release prints of a picture is, naturally, of tremendous concern to the cameraman, for efforts are centered in getting the best possible picture onto the screen. If his efforts are to bear fruit, it is therefore vitally important to him that the release-prints of his pictures, which are the prints which are shown in the theatres of the world, are well made, and present his picture truthfully to the public. But it is a matter of equal importance to the producer, for the quality of his pictures can only be judged by the prints of the pictures which are seen in the theatres. Therefore, if the print is good, he can be sure that his story and cast are displayed to their best advantage; if the print is bad, story, stars, and cast will all suffer, and with them the producer's professional standing—to say nothing of his heavy investments in the picture.

For some time the American Society of Cinematographers has been conducting an investigation of the industry's situation with regard to release-print quality. It has found that a condition exists which is not only important to the cameramen, but to the producers—and the whole industry—as well.

To put the matter bluntly, the situation is just this: every producer in the industry is paying large sums of money for stars and featured players, and for expert cinematographers who can photograph these expensive players to the best advantage: but they are not getting full value for this money.

They are paying for—and getting—the best of acting and photographic talent on the set.

They are paying for—and getting—the best of laboratory practice for the daily and master prints which they, personally, see, and which they preview for the local critics.

They are paying, and paying well, for release prints which will carry that same high quality to their millions of customers throughout the country—but they are not getting value received here!

It has been forcibly brought to our attention on many occasions that the release prints which are shown in the theatres here and elsewhere are so carelessly made that they are scarcely recognizable as the same fine pictures which are shown to us in our own studio projection-rooms.

Now this is a matter which involves more than the mere pride of the cameraman: it is of very vital concern to the producer, for his income depends upon selling his pictures—and, in the last analysis, his stars—to the public. Every producer knows the harm that bad photography can do to a star; the effects of poor laboratory work are no less harmful. Either one can make a star look "played out", and draw attention away from the story. It has been argued that the public does not recognize good or bad photography: this is partly true, but the insistence on the part of producers for the best of

photography is proof that they realize the fact that, while the public may not consciously recognize good photography, it does nevertheless unconsciously recognize—and resent—bad photography. And the public, not being as familiar with the details of picture technique as are those actually in the industry, can only blame these shortcomings on the star and the producer—and stay away from that star's or producer's pictures.

Inferior or careless printing can have identically this same effect. It can transform the most perfect photography into ordinary camerawork, and ordinary camerawork into hopelessly bad photography.

It must be said that the producer is rarely to blame for this situation. He is a busy man; he sees, as a general rule, only the perfect daily and master prints that are carefully made by his own studio laboratory: he has rarely either the time or the inclination to see his pictures again when they reach the theatres. He has seen perfect master prints, and, whether he is versed in photography or not, he knows that if one print of such quality can be made from a negative, two hundred, five hundred, or a thousand more can also be made from it. He knows that he has signed a contract for the necessary number of release prints with a laboratory which he believes is competent, and at a figure which he believes is reasonable. Therefore, he dismisses each finished picture from his mind, and concentrates upon the next one. He does not see the release prints which have been allowed to go out so badly printed that they are disgraceful travesties of the beautiful films he has made, or which have been shipped with entire sequences missing—left out by careless assembling in the release-print laboratory.

But the public does. It may not know just what is wrong, but it does definitely realize that **something** is wrong. It draws its own conclusions—and blames the star or producer.

Now, good release prints are not a commercial impossibility. "The Saturday Evening Post" is not a badly printed magazine even though there are two or three million copies printed each week. The processes of magazine printing are no less delicate or complicated than those of motion picture printing. The answer is that skill and care must be used in such work. This is not an unfair requirement, nor an impossible one. Certain studios have proven that good release prints are possible, and have found it commercially feasible to have such release prints. Some firms have achieved this by maintaining their own laboratories for release-printing; others have reached the same ends by demanding more careful inspection, and higher standards, in commercial laboratories. In any case, they have found first-class release prints not only possible, but commercially necessary. Yet there are still many instances of bad release-printing. Therefore, the American Society of Cinematographers, in cooperation with the Producers' Section of the Academy of Motion Picture Arts and Sciences, and the Association of Motion Picture Producers, is carrying on a programme of extensive research into laboratory practices, with the purpose of remedying this vital danger. The physical form of the release print, both silent and sound, has recently been standardized through the very good work of the Academy and its Producers'-Technicians' Committee; and that this great forward step has been taken leads us to hope that the even more difficult task of standardizing the photographic form and quality of release prints may likewise soon be an accomplished fact.

The Bomb Mike

by **WESLEY C. MILLER**

Chief Engineer, Sound Dept., Metro-Goldwyn-Mayer Studios

WHEN SOUND recording was introduced to the motion picture studios it was fortunate that the condenser type microphone had already reached a high state of development. Other parts of the equipment and technique were admittedly almost embryonic and required much attention and study. The microphone and its accompanying amplifier have, however, remained essentially unchanged, and in their original form have become well established accessories to be seen on any set.

Within the past few months the research activities of the electrical suppliers have culminated in the presentation to the field of two new types of microphone; the ribbon and the dynamic instruments. Many of these are already in use, and rapid progress is being made in the elimination of the difficulties which any new piece of apparatus may be expected to show.

At the Metro-Goldwyn-Mayer Studios studies were made of these instruments with varying results. Eventually the economic problem was raised of deciding the ultimate disposition of a large number of the old standard microphones in the event that one of the new types proved sufficiently superior to be adopted. As a result an attempt was made to improve the operation of the older instruments to the point where they were

comparable with or better than the newer types. The results were eminently successful and culminated in the adoption of a form of instrument which from its appearance was quickly nicknamed the "bomb mike."

The original standard instrument included an amplifier, usually a single stage, mounted in a tubular container arranged to be normally used in a vertical position. Attached to and beneath this amplifier housing was a housing for the microphone proper. The latter being connected to the amplifier by short shielded leads. The microphone and housing construction were such that the diaphragm was at the bottom of a tube, the diameter of the exposed diaphragm, and perhaps $\frac{3}{8}$ " deep with perpendicular sides.

It has been known for some time that a decided resonance existed in the instrument at about 3500 cycles per second, caused largely by this tubular cavity. The first corrective measure was then to reduce this effect. This was done by bevelling off the corners of the clamping ring down to within a short distance of the diaphragm, and by redesigning the mounting plate and guard screen so that the diaphragm was at the bottom of a conical rather than cylindrical well. The reduction of the resonance effect was immediately noticeable even in the original housing.

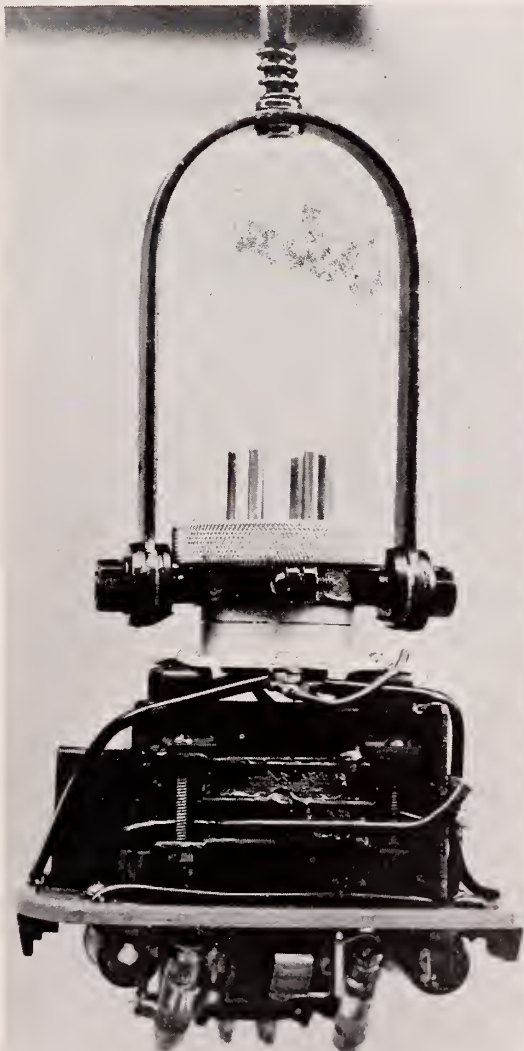


Mr. Miller pointing out the differences between the bomb microphone and the old type to Anita Page.

The next step was the application of acoustic theory to the design of the housing.

An ideal microphone would probably be of infinitesimal dimensions so that it would be effected by all acoustic waves passing it but would have no effect upon them. The best approximation of this condition has therefore been far from perfect. However, with the microphone of the present size we have to consider the effects of two phenomena, reflection and diffraction. The significance of the former is generally understood. Diffraction often receives less consideration—it is the term describing the distortion of a wave form as it passes an intervening body.

Under the usual set condition, sound reaches the microphone diaphragm in two ways. First, it comes directly from a source in front of the diaphragm. Second, and usually with at least equal magnitude, it is reflected from all the walls, reaching the diaphragm in varying amounts from every angle. Sound coming from any angle other than normal to the diaphragm sees the microphone as an obstruction, and is diffracted around it. That which strikes the diaphragm directly moves the latter, and then passes on. That which comes from other angles considers the obstruction first, and then strikes the diaphragm. The latter part is then quite apt to be in a sort of transition state, trying to get from the diffracted condition back to its normal form as the wave keeps going out past the microphone. If the diffraction is kept regular and of a minimum amount the



A closeup of the Bomb Microphone



The Bomb Microphone in use

transition condition is little different from the undiffracted sound, and the diaphragm is affected by an undistorted wave.

Two forms immediately suggest themselves; stream-lining and the sphere. The choice is simple. We are dealing with wave motion, not air velocity. Hence, stream lining is not what is needed. The sphere, on the other hand, can be proven to result in the minimum of distortion from diffraction.

In practice the size of the sphere is governed by several considerations. It should probably be as small as possible. On the other hand, it should be large enough to enable the microphone diaphragm to approximate the spherical surface. A six inch diameter sphere meets both conditions rather well, and at the same time, permits of a unique departure in amplifier design in that the complete amplifier may be housed in the spherical microphone container, thus making a single unit of the whole instrument.

Such a design has been completed by Metro-Goldwyn-Mayer Studios. The details will be evident from the illustrations. A light but rigid hollow cast aluminum sphere, 6" in outside diameter, smooth on the outside, and carefully machined at the joint between the halves, forms the housing. The microphone is mounted in the surface at an angle of 45 degrees

(Continued on Page 24)

A 35-mm. Portable Sound-Film Projector

by **HERBERT GRIFFIN**

International Projector Corporation

THIS new equipment consists of a portable motion picture projector and sound reproducing equipment of fundamentally new design, which in motion picture projection and sound reproduction will produce results even superior to those obtained with the best theatre equipment. It is the first apparatus of its kind which has been designed to fulfill these two requirements and in no sense is it to be confused with that type of equipment consisting of make-shift apparatus assembled from silent equipment with sound attachments added.

Excellent projection and first-class sound reproduction, of course, must be the major considerations nowadays when designing new equipment, and with this in mind the optical system for motion picture projection has been selected with a view to producing results heretofore unobtainable in this class of equipment. The illuminant may be either the T-20 900-watt, 30-ampere monoplane filament lamp, which has been generally used with excellent results in the medium size and smaller motion picture theatres of the country, or the T-20 1,000-watt 110-volt lamp. A pre-focus mogul base lamp socket is provided so that either of these lamps may be used interchangeably and, inasmuch as a separate circuit is provided to this pre-focus socket, no internal wiring changes are necessary regardless of the type of lamp selected. It is only necessary to plug a 110-volt A.C. line into the lamp receptacle, the position of which will be pointed out later, or when using the 900-watt lamp, a transformer designed for use in connection with it may be readily connected in the circuit.

The condensing system is the well known and extremely efficient Bausch and Lomb Cinephor PM-15 and PM-25, and the projection lens mounts are so constructed that any type of lens may be used having standardized dimensions. This means that the full-size, No. 2 or Series II lenses may be readily accommodated in any focal length.

The Sound Reproducer

The sound reproducing equipment has received equal consideration: the exciter lamp socket is rugged and the optical system is sturdy and rigidly mounted. The sound reproducing gate deserves special attention inasmuch as no tension shoes or springs are used at the sound take-off aperture. The film after leaving the sound gate feed sprocket is passed over a roller and tension is applied at this point. A curved plate is provided, the curvature following the tangent of the roller above referred to, and the film after passing the sound aperture plate follows the tangent of the plate over the rim of the sound sprocket. It is apparent, therefore, that the film remains in absolute contact with the sound aperture plate and that not only is buckling eliminated at this point but also, because there are no tension shoes or springs in contact with the film, there is no danger of emulsion collecting and causing the many defects in sound reproduction traceable to this source. The film is laterally guided by the edge on which the sound track appears, so that there is no weaving of the film in passing the reproducing light beam.

The photocell is mounted directly behind the sound aperture plate, and because there are no lenses of any kind between the plate and the photocell, the maximum amount of light is passed through to the cell. A shield completely envelopes the cell except for a small window to allow the passage of light from the optical system; and should it become necessary to quickly

replace the photocell, this shield may be immediately removed and the cell instantly replaced.

Referring to Fig. 1, the pre-focus socket providing interchangeability of lamps is seen at A; the Cinephor condensing lens system at B; the rear shutter housing on the operating side at C; and the operating motor with its cooling fan at D; the mechanical filter between the motor and driving mechanism may be seen at E; an auxiliary shield is seen at F, the purpose of this shield being to protect the projectionist's eyes from the bright glare of the projection lamp should it at any time be necessary to open the rear door while the projector is in operation. At G will be seen three switches, one for the exciter lamp, one for the projection lamp, and the third one for the operating motor. These are readily accessible through the rear door.

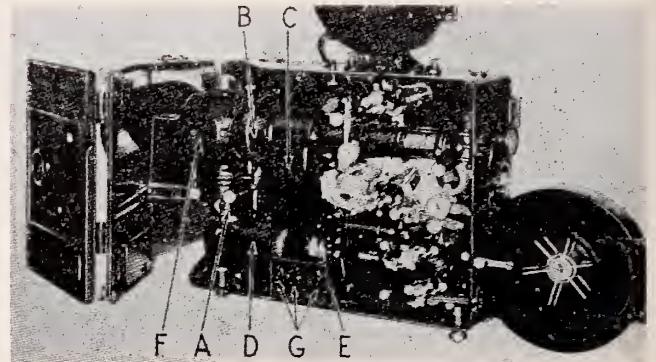


Fig. 1

Film Operating Parts

A complete idea of the arrangement of the film operating parts may be obtained by referring to Fig. 2, which also shows the film in place for operation. At A is the feed sprocket; at B the intermittent sprocket; at C the sound gate feed sprocket; at D the constant speed sound sprocket; at F the take-up or holdback sprocket; at G, H and J, are the pad rollers which maintain the film on the two feed sprockets and the holdback sprocket; at K and L are the tension shoes for the sound tension roller and the constant speed sprocket, respectively; and at M the tension shoe to maintain the film on the intermittent sprocket. All of these pad rollers and tension shoes are so designed that they are locked in either the open or closed position, and the possibility of their changing positions with relation to the sprockets when closed is entirely eliminated by the positive stops provided, which, once adjusted, always remain fixed in the same position thereafter. At N is the motion picture projection gate which may be opened or closed by turning knob O to the right or left, respectively, and in either position the gate is securely locked.

A double aperture of the vertical sliding type is provided and by turning knob P either the silent film projection aperture or the sound film projection aperture is brought into place and locked in position. At Q is a pilot light to give illumination for properly placing the picture in frame when threading. Stripper plates are provided for all sprockets, three of which may be seen at R, Fig. 2. At S is seen the framing handle controlling

the rotation of the intermittent sprocket for framing the projected picture either before or during operation; at T, U, V, and W, are seen the exciter lamp socket, optical system, sound aperture plate, and photocell shield, respectively, and the path of the film through the mechanism may be readily observed by careful study of this picture. The entire projector is built up of separate assemblies any one of which may be readily removed at will without unduly disturbing any of the other parts.

The operating mechanism is entirely enclosed on side also by means of two doors. Opening these doors exposes to view the mechanical operating parts of the equipment, as in Fig. 3. By referring to this figure it will be noted that the equipment is direct connected throughout to the motor; no belts of any kind are used, and a mechanical filter is placed between the motor and the mechanism so that vibrations or other impulses from the motor cannot be transmitted to the mechanism proper. The driving shaft then continues straight through the lower part of the projector and is gear connected to the constant speed sprocket shaft, the vertical driving shaft driving the balance of the projector, and the take-up magazine. The constant speed sprocket is satisfactorily filtered by the same type of filter employed in the motor shaft and there is but one pair of gears between the driving shaft and the constant speed sprocket shaft.

The intermittent movement and shutter synchronizing means are mounted in one common casting A, Fig. 3, and this system is fundamentally new in design. It also allows for but one pair of gears between the shutter shaft and the intermittent movement. The picture is framed by rotating the intermittent sprocket and this is accomplished by turning the framing handle shown at S, Fig. 2, when the entire intermittent and shutter support casting A, Fig. 3, is rocked in the arc of a circle, maintaining absolute synchronism between shutter and intermittent movement, and allowing the elimination of the entire train of gears ordinarily present to accomplish this result in all other types of motion picture projectors.

Oiling of the mechanism is accomplished through oil tubes running directly to every bearing from common manifolds, and the type of bearing used together with the excellently designed lubricating system are an absolute assurance against the binding of the mechanism at any time.

Rear Shutter Equipment

The revolving cut-off shutter is placed between the condensing system and the aperture as in modern professional equipment and is entirely enclosed, as shown at B, Fig. 3. It is well known that the placing of the shutter in this position immediately reduces the heat incident upon the film by fifty per cent., and inasmuch as the light beam is always of the same dimension

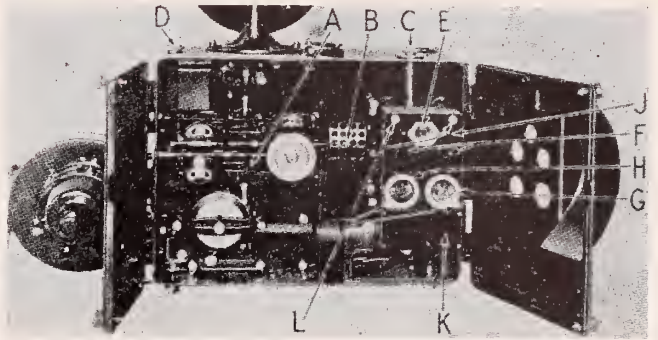


Fig. 3

in this position it is unnecessary to use shutter blades of varying widths. This shutter performs a double function; no fire shutter in the generally accepted term forms part of this equipment, but the revolving shutter, when the projector is idle, is entirely closed for its 360 degrees. When the projector reaches a pre-determined speed, two blades of the revolving shutter fly open behind two fixed blades, the shutter then becoming in effect the usual cut-off shutter with two 90 degree blades. Attached to the shutter shaft also is a fan for forcing a cool draft of air over the entire rear section of the equipment containing the lamphouse. At C, Fig. 3, is shown a dowser knob by means of which, if desired at any time, the light may be cut off from the screen while the projector is running; and at D is shown the knob for sharply focusing the projecting lens.

In the rear (Fig. 3), we see the input and output receptacles for carrying the current to and from the equipment during operation. At E is the 110-volt input from the line;—this feeds

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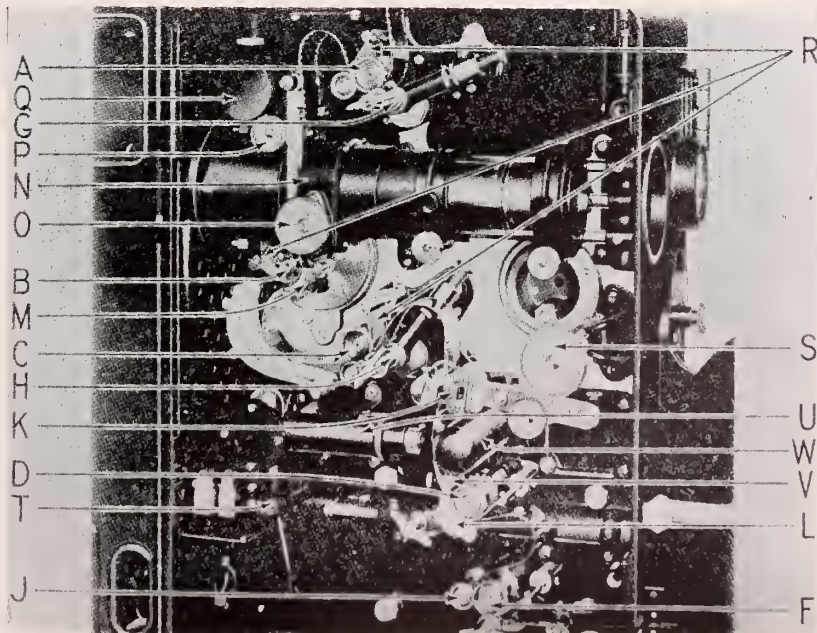


Fig. 2

A Standard Grey for Linens

by VIRGIL MILLER,

Head of Camera Dept., Paramount Studio

THE MOTION picture may be an art, but it is also a vast manufacturing business. Therefore anything that can possibly increase the efficiency of production is definitely desirable. As a whole, production methods of today are more efficient than they ever have been—perhaps as efficient as they can ever be in so unique a business. But there remain many smaller details which can be improved with great benefit to the industry as a whole.

One of these is the matter of standardizing upon some definite shade of material for textiles—personal, table and bed linens, especially—which are to be rendered photographically as white, but which, for photographic reasons, may not actually be white. Of course, the most desirable condition would be one that permitted the use of fabrics which were actually white; but unfortunately, this is rarely possible. Large expanses of white surface, such as those presented by table and bed linens, and smaller expanses of white, in close proximity to larger areas of non-reflective blacks and dark blues, as encountered in men's dress wear, etc., give rise to halation when photographed. In other words, they tend to glare, and the image of the white area enlarges itself to spread over the adjacent, darker areas. Therefore it has been for many years the custom to use fabrics of some other hue, which, though pale enough to photograph as white, are still sufficiently tinted to avoid the glare and halation which are so undesirable. This is a very reasonable and necessary practice, but unfortunately there has been no attempt to adopt a standard hue for these textiles. Instead, the matter has generally been left to the option of the individual cinematographer, or to the whim of the wardrobe or property department in question. Accordingly, there are a surprising variety of hues in general use: pale blues, pale yellows, ecru (a pale, reddish pink), and pearl (or "Pickford") grey being the most common.

This naturally leads to a most confusing situation, and to much useless duplication and expense to the studios and to the individual players, as well. A studio may have practically standardized upon, say, pale yellow for all the linens in its wardrobe and property departments, while another one may have adopted ecru. Each may have perfectly good reasons for making this choice; it would all be very well if studios were entirely self-sufficient, and studio personnel were stationary. But sooner or later a cinematographer from one studio will be engaged by the other: then when scenes requiring dress garments, or large displays of table or bed linen are encountered, that cinematographer will, quite naturally, demand textiles of the hue with which he is most familiar. In all probability, the wardrobe and property departments will be forced to supply him with what he requires, and be themselves forced to either duplicate the items required in the new shade, or to dye their existing ones to suit the cinematographer's choice. In turn, they will naturally attempt to use these duplicated items in the next similar picture, which may be photographed by a man who will flatly refuse to use that particular shade—and who may even prefer a third color, requiring still further duplication. All of this is a heavy expense to the studios, and it is a still heavier drain upon the resources of the individual actors, who maintain their own wardrobes, and who must naturally comply with the wishes of the cameraman as to the shade of their linen accessories. And if they decline to cooperate, it puts the cameraman at the disadvantage of having to adapt his lightings and filters to attempt to make two or three or even four different hues of linen all photograph as the same clear white.

Obviously, this is not an efficient state of things, for it consumes time, money, and tempers needlessly. Therefore, common sense indicates that there should be adopted one standard hue for such fabrics, which would be the same throughout the industry, and which would remain the same under all photographic conditions.

To this end, the Photographic Department of the Paramount West Coast Studio, has for some time been conducting tests to determine just what is the best shade for this purpose, with a view to adopting this shade for a standard in our own pictures, and with the hope that the Camera and Wardrobe Departments of the other studios will benefit by our experiments, and eventually adopt the same standard themselves.

In our researches, we have tested whites, light blues, pale yellows, ecrus, and several shades of light grey. Our requirements were simple: we sought a shade which would positively remove halation, and which would photograph a clear white **under every condition of lighting and filtering met with in ordinary production.** Our results were very positive. The blues were ruled out almost immediately, due to the fact that they are affected not only by the yellow filters, and by incandescent lighting (which gives a correction approximating that of daylight and a K-1½ filter), but by the deep red filters used in making night scenes by daylight; these latter filters changing the blue to black. The pale yellows are likewise affected by filters. Ecru was found to be rather better, particularly with the new, highly panchromatized "Fast Film." But the greys were the only ones which were found to remain uniform throughout the entire range of conditions met with in production. Pearl grey—or "Pickford grey," as it is frequently called—is definitely the best shade for this purpose. It is sufficiently un-white to eliminate halation, and, being a non-chromatic tint, it cannot be affected by any conceivable combination of lighting or filtering. It has furthermore met with the complete approval of the majority of the individual cinematographers in the department. Therefore, this studio is definitely standardizing on the use of such material for all purposes.

It may be asked, why, in view of the recent introduction of the "greyback," non-halation film bases, is it necessary to go to further trouble in attempts to reduce halation? Will not the film itself take care of this?

The answer is that the film will do a great deal to reduce halation, but that in extreme cases, such as encountered in men's dress clothes, where relatively large areas of unrelieved white are adjacent to equally large areas of unrelieved black, it cannot completely prevent halation. Under some conditions, it probably would be quite sufficient; but on a large set, with the light playing from so many different angles, and particularly with such large amounts of top back and side light as are now used, halation is almost inescapable. The new films undoubtedly reduce halation in these instances to the minimum: in fact, were the picture area of the film larger, they would probably eliminate it completely, in so far as practical results are concerned. But the picture area is so very small, with such minute images, which are in turn enlarged so tremendously when projected, that even the minutest vestige of halation becomes of consequence. Therefore it behooves us to employ every means at our disposal to eliminate the slightest trace of halation. The new film-bases go a great way in doing this, but since we have the means of aiding them at

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A "Little Fellow" Carries On

A Word from the Commercial Film Man

by EDWIN L. DYER, A.S.C.

WHENEVER a group of Hollywood studio cinematographers get together, sooner or later the conversation will turn to the "good old days" when they were struggling newsreel or commercial film makers—long before they came to Hollywood and its completely equipped studios. For most of the outstanding cinematographers of today received their cinematographic baptism in the commercial film business long ago. Naturally, they like to sit and spin yarns of those early days, when they had virtually nothing to work with—and everything to do. Naturally, too, having worked so long in the luxurious surroundings of studio production, they are inclined to consider the conditions of these early days as gone forever.

But they are not! The commercial film business hasn't been blessed with the untold millions that have been poured into studio production—so even today the life of a commercial cameraman is much the same as it was years ago. He must still, as a rule, be cameraman, director, production manager, laboratory staff, business manager, distributor, and everything else himself. Of course, some few firms in the larger cities have waxed prosperous, and become sizeable producing organizations; but the little fellow still exists in most cities, and—believe it or not—still manages to make pretty good pictures, and even to eat now and then.

Everyone undoubtedly remembers the first attempts at screen advertising—badly colored and cracked slides advertising the local butcher, baker, and candlestick maker. Then some enterprising wight bought himself a movie camera (or, more likely, made one) and proceeded to sell the local merchants the idea of using real, honest-to-God **movies** instead of the slides.

Most of these early ads were animated cartoons—sometimes merely animated, cut-out letters; later, jerky, animated drawings. But they were a start. Soon the local clothiers, motor-car dealers, and the like, began to want real moving pictures of their products. These were at first shot outdoors as a real studio would have been an impossible expense. All that one could possibly have was a camera, and a laboratory of sorts, questionably dark, but miraculously adequate for the old ortho film of the day.

The cameras used for this were equally crude. At first, a lot of the boys built their own cameras out of old projector-heads. Then, growing more prosperous, they managed to acquire amazing bargains in antiquated Pathes, Williamsons, Ernemanns, Prestwiches, and so on. The man who owned a third-hand Studio Pathe was considered prosperous indeed—and he who had a real Bell & Howell (of any age!) was rich indeed. Then came the war, and in its wake a lot of Government-surplus cameras. New Universals came down as low as \$400! That was an awful lot of money for a camera—but the Universal was a marvellous camera, so a lot of us plunged, hoping that business and the bankroll would somehow stand the strain.

Our laboratory equipment was quite in keeping with our cameras. Usually it consisted of home-made pin racks and trays, capable (sometimes) of handling a whole hundred feet. If we were rich and ritzy, we might own a Stinemann developing drum—a 200-foot one if we were **very** rich—and perhaps one or two tanks. Printers? Well, the less said about them, the better. Many of us built our own; those of us who were better off managed to acquire ramshackle William-

son or other printers, which had usually had so much experience that they leaked light in every direction—in spite of being swathed with layers of adhesive tape. And yet, the darn things managed to print passable pictures for us oftener than they fogged them.

And, incidentally, as far as equipment goes, most of us were inveterate traders. Not that we often bettered ourselves by the trades—but at least we exchanged stuff whose shortcomings we knew for junk which might perhaps not



Edwin L. Dyer, A.S.C.

have those particular faults, though they inevitably brought their own new troubles. I imagine that the dealers must have had many a laugh at our expense! I remember once of a trade that surely must have given one dealer many a chuckle: in a certain mid-western city there existed—how, no one knows—two commercial cameramen. These fellows were not only commercial rivals, but personal enemies, even to the extent of taking enthusiastic punches at each other now and again. Each, according to his rival, was a thoroughly rotten cinematographer, and owner of the most worthless equipment in the world. The one point in common between the two was that they would make periodical pilgrimages to this dealer, returning with new booty. Once it happened that their visits synchronized beautifully: each had just shipped his old printer in, and followed it himself to select a new one. They arrived within a few days of each other, made their selections, and

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Hal Hall

SAYS



A Sensible Idea

SOME of the sanest suggestions regarding the making of motion pictures that this writer has heard of in many years are to be found in a paper by Frank Woods, former Executive Secretary of the Academy of Motion Picture Arts and Sciences, entitled "Improvement of Screen Entertainment."

Outstanding in the paper is the suggestion that feature pictures be cut to the length warranted by the story, and not be governed by the idea that to be a feature picture it must be of a certain length—even though the story has to be padded out in such a way as to spoil what might have been a good picture. Mr. Woods suggests that the feature pictures, except in unusual cases, be cut to an hour or less. In exceptional cases where the picture runs longer, Mr. Woods suggests that the over-length be fully justified by audience appeal.

Among the other suggestions are to found the following:

Restore to feature pictures a larger measure of fast action which formerly gave to them their greatest appeal, utilizing all devices, including parallel lines of action to give us genuine motion pictures.

Do not sacrifice, however, the great boon of vital dialogue and sound effects.

Remember that the original lure of motion pictures was the illusion of reality. Therefore, avoid straining credulity. Emphasize truth.

Continue to improve still further the production quality of features.

Arrange future production plans to avoid over-production of single types of stories by all companies.

Balance the program with short subjects that will make the second hour's entertainment supplement in diversity the feature hour.

Concentrate attention on the production quality of short subjects by paying more rental for them, with a view to raising their appeal as nearly as possible to a par with features.

Increase the importance and showing time of news reels by interpolating side shots of human touches and reactions.

Produce short special news subjects when the events warrant, together with short true stories.

Endeavor to provide better types of short comedies, in place of the over supply of silly trash, paying real money for ideas.

Introduce "true story" and action quality into travelogues and the like.

Seek for new ideas for short subjects of all kinds, by intensified search and money rewards

The genuinely big picture should be confined mainly to subjects of big and commanding importance, although program features may frequently show super-special quality. Big pictures are the high spots of the industry. They should justify their length by their power to command audience interest throughout their running time.

Epics on historical subjects should include great moments of history truthfully pictured.

Release Prints

ON another page in this magazine will be found an article dealing with the subject of poor release prints. A short time ago the action of the American Society of Cinematographers regarding the poor release prints found its way into the various motion picture trade papers.

And now, in the August 22nd issue of Motion Picture Herald, we find Mr. William Kelly, MGM's supervisor of print work, quoted as saying:

"Just so much blah. The obvious idea is that someone is offering alibis for camera work."

If Mr. Kelly really made such a remark, this writer is surprised: for it would seem to indicate that Mr. Kelly is not keeping as closely in touch with the picture business as he should, holding the position he does. If one has eyes and a comparatively small amount of brains he will long ago have observed that the camera work is one of the few elements in the picture production field that has been consistently good. Many a sadly cast and produced picture with a story not worthy of the name has been saved by the excellent cinematography. The studio executives watch the photography with much more vigilance than they appear to watch most of the other elements of production. A cameraman, unlike a supervisor, is out if he turns in a rotten job. He has no alibi. He wants none. If his work is poor he does not try to "pass the buck".

What the American Society of Cinematographers is trying to do is to try to bring about a condition whereby all release prints are uniformly good. Those who criticise the cameramen for wanting to make pictures better shows either a large degree of misunderstanding, or else they do not have the real interest of the picture industry at heart.

Nat Saland, president of Craft Film Laboratories, quoted in the same issue of Motion Picture Herald as Mr. Kelly, agrees that there is merit in the charges of the cameramen and practically admits that the claims of the cameramen are true in some cases when he is quoted as saying:

"When sloppy work is turned out, it is because producers batter down the prices of small plants to such a low level there is no margin of profit for quality work. Also, laboratories who finance producers sometimes find themselves working in too close a margin, where quality must suffer."

That is saying a lot, Mr. Saland. And this writer admires you for it.

All anyone needs to do to see the poor release prints is drop into any but the first run theatres and take a look for himself.

Musicals

IT IS good news to hear that musicals are coming back. Let us hope that they are good ones, and that no player be allowed to sing unless he or she has a good voice and knows how to use it. That was one of the reasons musicals fell by the wayside.

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Sound Pictures and Solar Problems

(Continued from Page 9)

other instruments for the more customary eclipse observations were set up at these stations. A great deal of consideration was given to the matter of landmarks which could be identified in the pictures of the shadow. Huge crosses of canvas were suggested, and whitewashed areas and buildings, in addition to the natural features of the landscape. All these were used to some extent, but in the end we relied chiefly on pairs of 25,000 candle-power flares, suitably placed and set off by alarm clocks. By placing these pairs of flares, some parallel to the central line of the computed path of the shadow and some perpendicular to it, and by spacing them differently in certain patterns, we could identify any pair in any frame of the picture.

Eventually, two large planes, each with two experienced pilots, were placed at the service of the expedition. One was a tri-motored Fokker cabin plane and the other a large Fairchild army plane. The Fokker, assigned to the Ramm's Ranch station, was equipped with a first-class motion picture camera, and flew from Mather Field.

A place on the dry bed of Honey Lake was chosen as the base for the army plane. In this plane were installed the sound camera with its amplifiers and batteries and the radio receiver. Arrangements were made with the Navy Department to broadcast time signals each second during the period of totality for this region.

A number of test flights and exposures were necessary so that all the complex manoeuvres of observers and instruments could be tried out and coordinated, the pilot, for instance, handling the plane so that the camera could follow a train on a curved track. All this was accomplished from Clover Field where the instruments were installed in the army plane under Captain Stevens who commanded the plane, and who, being himself a skilled aerial photographer, aided the sound camera expert by operating the camera.

On the day of the eclipse heavy clouds covered both sides of the mountains throughout the period of the eclipse. Only through breaks in the clouds were glimpses of the pageant seen from the ground. From the air, the sight was marvelous indeed. The plane from Mather Field, finding clouds over Ramm's Ranch, flew westward over the predicted path, as had been planned in case of such a contingency and took pictures of the country below, though not quite sure of the shadow, battling with cold and exhaustion at an altitude of 19,000 feet. Interesting pictures they are, taken through scattered clouds, but the shadow of the moon could not be defined in them.

The flight of Captain Stevens and his two associates in the army plane was even more dramatic and, I believe, also historic. The story is recorded in Pomona College publications—how they waited under the clouds, all ready to go, until hardly an hour remained to reach the great altitude required; how at last a small clearing appeared, and they took off, pushing up through this hole, through a mile-depth of clouds, and then came out above them; how they climbed still higher until they reached 18,500 feet, just in time to swing into position as totality began; how they blanketed their instruments to keep them warm and themselves to keep from freezing; how they had to conserve their oxygen supply; how they saw the shadow appear in the distance and rush on toward them; how they beheld it appalled, not realizing at first what it was; how they got their pictures in spite of every difficulty; and how they came down at last, through the clouds, to a safe landing on the dry lake bed—a thrilling story as told by Captain Stevens and his companion, James W. Balsley.

For the first time in history those men saw the great shadow of the moon coming upon them with terrific speed across the surface—not of the ground, alas—but over the upper surface of the clouds. For the first time motion pictures were taken of this phenomenon as the shadow came and went.

Astronomically, of course, we were disappointed that the shadow was not seen upon the ground where its exact position could be determined, instead of upon the rough and billowy surface of clouds where its outline was too vague to be well marked in the film, although it may be readily followed on the screen. Great as our disappointment was at the time, we know now that, while leaving much to be desired, the expedition was far from being a failure, as I shall point out in a moment.

So far I have spoken of one of the two problems in which our expedition was chiefly concerned. Let me now, much more briefly, refer to the second problem.

In this we undertook to measure the intensity of the sun's radiation, especially the intensity of the sunlight itself, at a number of points in a line across the path of totality. Five such points some 500 yards apart were selected at Ramm's Ranch, in a line perpendicular to the computed central line. At each point an instrument was placed, consisting essentially of a photoelectric cell and amplifier, and a millimeter whose index marked the changes in intensity of light as the shadow passed over the point during the partial and total phases of the eclipse. All these millimeters, each connected by long lines to its distant photometer, were mounted upon a panel at a central station together with two timepieces, so that all these ammeter dials and clock faces could be photographed simultaneously by a motion picture camera—by two of them, in fact. In this way a continuous picture was taken showing the variation in light intensity at each point, and graphs were plotted for each point. The net of these curves, then, not only locates the path of totality, but tells much more as to the intensity of the radiation and illumination.

At the national meeting of the A. A. S. in Chicago, last August, where the work of this expedition was reported to the Astronomical Section, it was agreed that two things were accomplished that were quite worth while. The solution of two entirely new problems had been undertaken. In both cases a new technic was proposed and tried out, establishing a new method which might be tried again with good hope of success even though the conditions would not be so favorable again for perhaps a hundred years. Already we are considering a repetition of the experiment with the eclipse of August, 1932, in New England.

This paper was presented at the 1931 Spring meeting of The Society of Motion Picture Engineers, and is published here through the courtesy of the Society's Journal.



Mitchell Announces New Rolling Tripod

AN addition to the rapidly-swelling Mitchell line is a new rolling tripod for studio use. Unlike most devices of this nature, it is scarcely heavier than a standard cinema tripod, yet it is capable of supporting even the heaviest silencing "bungalows" now used. The height of the camera is controlled by a single crank, which by means of a triple-extension, telescopic support allows an unusual range: the lens of the camera may be dropped to within a yard from the floor, or raised to a height of nearly eight feet, with perfect stability at all positions. The head mechanism is the standard Mitchell friction head, with its telescopic arm, enlarged and strengthened to operate perfectly with even the heaviest of "bungalows," some of which weigh several hundred pounds. Due to its small size, and unusually great extension, this device should find favor in studio use, as it is sufficient for most uses, and therefore makes it possible for a single unit to replace three or four less flexible ones of varying sizes. In addition, as the device is equipped with standard Mitchell tripod legs, it may be used away from the studio, on location, very satisfactorily.

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The Bomb Mike

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in the lower hemisphere; this being an approximation of the normal mounting angle for the diaphragm. The amplifier inside is so arranged that in this position the vacuum tube is vertical. Other angular positions of the diaphragm are obtained by means of a swivelled mounting bail at the top. Connections are made through the usual type of plug, also at the top. Thus, the only departures from the spherical shape are the diaphragm, the plug, and the mounting bail. These are so slight that their effect is small.

The amplifier apparatus is identical to the standard. However, its arrangement is now such that not only is servicing much simpler than in the tubular mounting, but the electrical arrangement is superior. The microphone proper is also identical with the exception of the beveling mentioned before. It is mounted in a separate holder which screws into the sphere casting, and makes connection with the latter, and with a spring connector inside. The holder carries the guard screen which, incidentally, is made of coarser mesh and heavier wire to prevent the diaphragm action which sometimes existed with the earlier fine mesh screen. With this construction the replacement of a microphone is a matter of a few seconds. Along with all of these changes the weight of the entire unit is but 7½ pounds, a reduction of 5 pounds over the standard.

Measurements are being made to determine quantitatively the exact improvement which has been made. These have not progressed to the point where they may be published, but they indicate a corroboration of the theory. Listening and recording tests have, however, been made under every condition which arises in recording practice and practically without exception the results with the bomb microphones have surpassed those with any other instrument which has been available for test. The effect is particularly pleasing in that the results of low frequency reverberation are so handled that roundness rather than tubbiness is felt. Music is definitely improved. The impression is that of a certain stereoscopic quality almost approaching the binaural listening which we get with our two ears. It is felt that the reason for this is the minimizing of distortion of the sounds of reverberation. The effect on direct sound is small other than through the reduction of resonance. The effect on indirect sound is great and uniform. The combination when used with existing reproducing equipment is most pleasing. So pleasing in fact that the instrument has been adopted as standard for studio use by the Metro-Goldwyn-Mayer Studios. It is predicted that a similar form will ultimately find general adoption elsewhere.

◆
Standard Grey for Linens

(Continued from Page 16)

hand, we should employ them as well. And since we must employ such aids, we should by all means standardize them within the industry, for the general artistic and economic betterment. By so standardizing, we will not only improve the quality of our photography, but we will improve working conditions for cinematographers, and arrest a serious financial drain on both the studios and the individuals. And in times like these, if we can make production less costly and more efficient, it is manifestly our duty to do so.

◆
New Sound Apparatus

KNOTEK, a Czechoslovakian motion picture technician, is working on a new sound film apparatus which Prague professional circles assert will revolutionize existing sound patent devices. The sound is electrically recorded on two different tracks and can be reproduced immediately. The apparatus will cost from \$250 to \$300.

.. In the Realm of Sound ..

"Vanities" Use Sound System

EARL CARROLL'S "Vanities" have adopted the Western Electric Public Address System for sound amplification and in doing so they are presenting to the public, for the first time, innovations that promise to revolutionize legitimate stage producing.

At the new 3,000 seat Earl Carroll Theatre, the largest house in the country for legitimate stage production exclusively, a complete system of loud speakers has been installed for the new "Vanities". Six loud speakers have been installed in the auditorium itself and 20 in other parts of the building.

The innovation is the result of demonstrations that have shown the lifelike amplification of the human voice by this system and is being introduced by Mr. Carroll as part of his policy to provide mammoth musical productions at a reasonable cost to large sized audiences. The loud speakers will insure perfect transmission of sound from the stage to every part of the house.

Among the features that will be possible because of this innovation in the auditorium itself are:

(1) A general reinforcement of music and voice from the stage;

(2) A disappearing orchestra working on an elevator platform so that after the orchestra has descended to the basement, the platform can be replaced and used for the stage production while the orchestra's music is still audible to the audience;

(3) Provision for individual features involving a specially constructed microphone arrangement, including a microphone that can be raised from alongside the footlights through a push spring operated by one of the actors on the stage. This microphone system permits various combinations of musical effects on and off stage;

(4) The use of special records to reproduce off stage sound effects.

In addition to loud speakers in the auditorium itself, others, in dressing rooms and in the lobby will help evolve a general efficiency system.

In the lobby the loud speaker makes possible the curtain announcement for the beginning of each act.

The loud speakers in the dressing rooms will enable members of the cast to hear a continuous reproduction of the performance on the stage and will make it possible for the stage manager sitting in the wings to keep the players in their dressing rooms advised of the play's progress and of their cues, eliminating the call boy's nightly rounds.

The Public Address System installation at the theatre was made by Electrical Research Products represented by J. J. Way, Public Address System specialist and by I. F. Durst who supervised the work of installation.

500 Special Size Units Sold By RCA Photophone

INITIAL manufacturing order of 500 units of Special Size RCA Photophone reproducing equipment, designed for small theaters, has been practically absorbed, and a duplication of the order has been entered, it is announced by E. O. Heyl, vice-president and general salesman. Majority of the installations are replacements, says Heyl.

Westinghouse Develops Lighting Control Relay

TO enable the intensity of natural light to control artificial lighting automatically, a new photo-electric lighting control relay has been developed by the Westinghouse Electric and Manufacturing Co.

The operation of the lighting control relay, the company declares, is effected by variations in the intensity of light falling on the photo-electric tube. These variations produce proportional changes in the amount of current passing through the tube, and this changing current, amplified in a specially designed amplifier tube, energizes a primary relay controlling an auxiliary contactor, which, in turn, operates the main contactor controlling the lighting installation.

Automatic control applied to illuminated signs and show windows effects a maximum of advertising value, since it turns on their lights whenever artificial lighting can increase their visibility, and turns them off when artificial illumination fails to enhance their attention-getting power, the company claims.

Projection Rooms Made Portable and Permanent

PORTABLE and permanent fireproof projection rooms are being offered by the Blue Seal Products Co. of Brooklyn, manufacturers of motion picture accessories.

The booths, which are obtainable in standard sizes ranging from 4 feet by 6 feet by 7 feet, 1 1/2 inches high, to 9 feet by 14 feet by 7 feet, 1 1/2 inches high, are made of 1/4-inch thick transite with angle iron 1 1/4 inches by 1 1/4 inches by 3/16 inches. The panels are interchangeable and bolted together with stove bolts and the seams filled with transite cement. The floor sheets are of 3/8-inch thick asbestos.

Underwriters throughout the country, as well as the fire and building departments of all cities, have approved these booths, the company states.

New Sound Film Sets Put on French Market

THE following sound film reproduction sets have recently appeared on the French market:

"Universal," produced by the Societe des Appareils Sonores. The price of 45,000 francs includes complete installations including two projectors for the projection of sound film bearing the sound recorded on film. The system may also be adapted to any existing projectors. It is stated that this set includes numerous technical improvements one of them being the elastic suspension of the projectors which is supposed to improve the purity of sound by the absence of mechanical vibrations of the sound head.

"Teleson," produced by Societe Teleson-Film, is a sound head group that can be adapted on any projector. Price is 35,000 francs for complete installations.

"Echo-Gesco," produced by the Societe Gesco, is a new sound head adaptable to all existing projectors. No price has been quoted for this apparatus. All the above sets are more especially adapted to the needs of small cinemas.

Laboratory Department

Conducted by EMERY HUSE, A. S. C.

Principles of Sensitometry and Their Practical Application

Part 5

SENSITOMETERS

UP TO this point we have dealt only in sensitometric generalities, except for the rather detailed explanation and definition of the term "exposure". The proper sensitometric exposure necessitates more than a single exposure at a single intensity for a single time. What is needed for sensitometric practice is a series of graduated exposures for which the time and intensity factors are very precisely known. Naturally it is not feasible to make this graduated series of exposures by hand. A mechanical device of some type is necessary. Since the days of Hurter and Driffield it has been possible to make a series of graduated exposures by various means with the use of various instruments but fundamentally the procedure is the same. The instrument by which such exposures are made is termed a **sensitometer** and a sensitometer may be defined as an instrument for impressing upon a photographic material a series of precisely known and graduated exposures. Since it is of vital importance that high precision and reproducibility be obtained in exposing photographic materials, it will be necessary to devote considerable time to a discussion of the various forms of sensitometers that have been and are at the present time being used. However, before entering into what must be, for a time at least, an historical resume of sensitometers, we should discuss some of the fundamental characteristics which are necessary for a proper understanding of the instruments. After doing that we shall return to a discussion of some of the various instruments which have been and are in existence.

The essential elements of a photographic sensitometer are shown in Figure 4, which represents a schematically generalized diagram. A light source of known intensity emitting radiation of known spectral composition is represented by S. This is placed at a distance D, from the exposure plane, R. The surface of the photographic material, P, to be tested is made to coincide with this exposure plane, being held therein by some convenient element. Between the exposure plane and the light source is located some type of exposure device, M. It is necessary that the effective size of the light source and the distance be so chosen that the illumination, I, incident upon the exposure plane can be computed by means of the inverse square law, the candle power of the source, of course, being known. Moreover, the area of the surface of the photographic material

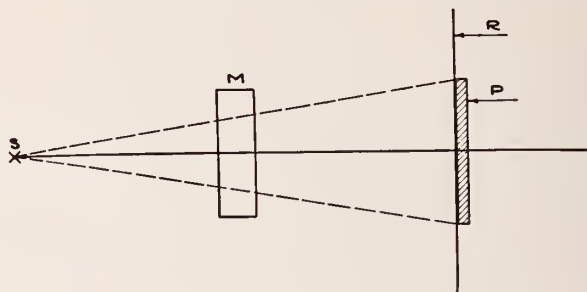


Fig. 4

to be exposed should be so related to the distance that the illumination on the area is the same at all points. Under these conditions with no exposure device in place, or operating, the entire surface of the photographic material will be uniformly illuminated. The function of the exposure device is to break up this uniformity in such a manner that various areas of the photographic emulsion surface are subjected to a series of different exposures which can be precisely determined. In some cases the exposure device is one which breaks up the exposure into various time factors, while other conditions can be met which will break up the exposure from an intensity standpoint. By this means we have time scale and intensity scale modes of sensitometry available. These will be discussed in more detail later.

Light Sources

The characteristic of light sources used in sensitometry are of utmost importance. Sensitometric characteristics must be precisely determined in order that they be of value and emulsion characteristics depend to a large extent upon the characteristics of the light source. There are two things relative to the light source which must be precisely known and maintained; they are, first, the intensity and, second, the spectral composition. It is well known that with the use of panchromatic films light sources of different quality produce markedly different results. Therefore, it is easily seen how necessary it is to maintain a standard condition in the light source used for sensitometric purposes.

It will be interesting and perhaps profitable to devote a little time to a consideration of the light sources that have been used in sensitometry. Long before the first use of sensitometry pictures were made almost exclusively by sunlight (or sky light).

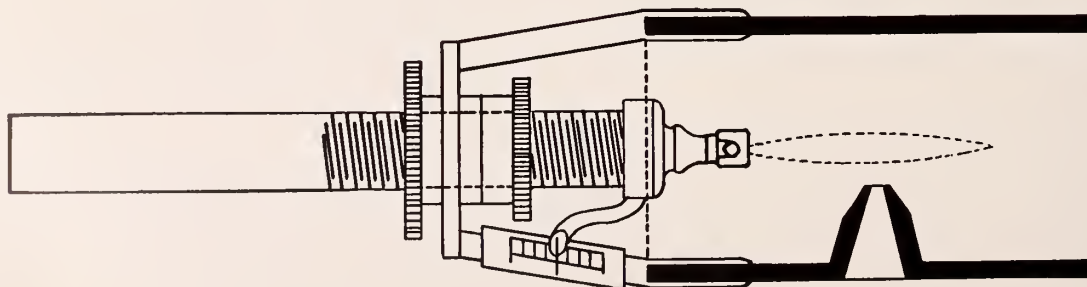


Fig. 5

It is only natural then that the first sensitometers used to measure the sensitivity of photographic materials should use this light as the illuminant. However, sunlight (or sky light) had its disadvantages owing to the variability of the intensity and the difficulty of control.

In 1881 a photographic group in London appointed a committee to consider the standardization of plate testing. This committee recommended the adoption of an intensity scale type of sensitometer which was devised by Warnerke. The light source from which the exposure was made was a phosphorescent plate employing a layer of calcium sulphide. This plate had to be activated first by burning magnesium ribbon near the surface of the tablet. This, as can readily be seen from our present day knowledge, was an impractical sensitometer.

The selection of a light source for photographic sensitometry must of necessity be chosen after a consideration of photometry. From the standpoint of artificial light sources we can see by the use of the word "candle power" that the candle must have played a part. In Great Britain a standard candle was defined in the Metropolitan Gas Act of 1860 and for many years was the officially accepted unit of luminous intensity. This candle was made of spermaceti wax to specific dimensions with a wick of specified material and size. Operated as a standard candle it burned 120 grams of spermaceti per hour. When Hurter and Driffield began their work on sensitometry they adopted this unit of luminous intensity as the light source. However, this artificial source failed to continue as a standard due to its lack of reducibility in meeting the requirements as a standard of luminous intensity. In 1898 G. A. Vernon-Harcourt adopted the pentane lamp. This lamp burns a mixture of pentane vapor and air in a wickless burner. In the final form which was adopted in England as an official standard for gas testing a lamp giving a luminous intensity of 10 candle power was used. Hurter and Driffield, after ruling out the candle, adopted this lamp as their standard.

In 1884 in Germany the Hefner lamp was invented and was adopted as the official unit of luminous intensity and still is the official standard in that country. This lamp burns pure anil acetate. Scheiner and his followers adopted this light source for photographic sensitometry.

Voille proposed the use of an acetylene flame in 1895 and Sheppard and Mees in their investigation of the theory of the photographic process employed this as their standard. The type lamp used by them was very unsatisfactory and later on in their work they adopted a different type of acetylene burner which was extremely useful and for a long time was used as the standard light source in photographic sensitometry by the Eastman Kodak Company Research Laboratories. The design of this burner is shown in cross section in Figure 5. This burner gives a cylindrical flame, the brightness of which varies somewhat from top to bottom but there is a considerable portion approximately half way between the tip and the base of the flame where the luminous intensity per unit area is very constant. By placing a screen or diaphragm very close to the flame a section can be isolated which serves as a fairly satisfactory standard light source. As a result of investigations by L. A. Jones, it is possible to so adjust this lamp that with use a very slight percentage change is noticeable. The burner as set up for use operates under a gas pressure of 9 cm. of water. The calibration of this lamp must be accomplished by comparison with certified standards of candle power obtained from some standardizing laboratory such as the National Bureau of Standards of this country.

♦ Research Tour

THE KODAK Research Laboratories are among eleven research organizations in various industries selected for a visit in October by 100 industrialists and bankers on a tour to be conducted by the National Research Council. The purpose of the tour is to show business leaders what is being done in the advancement of scientific research.



There Are Lots Of Good Lenses ...

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**Sound Engineering Dept. Added
By Oliver Supply**

A SOUND service engineering department has been added to the Oliver Moving Picture Supply Co., which recently bought out the Tone-O-Graph company, and is now prepared to service all Tone-O-Graph installations in this territory as well as furnish replacement parts required either for Tone-O-Graph or any other type of independent sound equipment.

In addition to serving these equipments, E. E. Oliver, president of the company, announces the opening of a consulting engineering department under the supervision of Homer D. Briant, formerly of the National Theater Supply Co. and the E. E. Fulton Co.

**Arthur Reeves Heads Hollywood Motion
Picture Equipment Company**

ANNOUNCING the organization of the Hollywood Motion Picture Equipment Company, with headquarters at 6416 Selma avenue, opposite the offices of Local 659, Arthur Reeves enters on a new affiliation. For more than a year he has been a founder and a half owner of the Hollywood Camera Exchange, in the success of which he has had a large share. He will continue to hold a substantial interest in that corporation.

In his new home the veteran cameraman will specialize in sound equipment, to the development and in the expansion of which he has given the major part of his time during the last year, and in motion picture accessories generally.

In the selection of the corporate name it has been the object to set forth exactly the aims of the company. In other words it is intended to be able to equip a studio completely and to do the identical thing in the case of a laboratory.

In both departments every effort will be made to keep a step ahead in the developments and improvements. Among these latter will be the realization in actualities of the ideas of some of the industry's best technicians.

Among Art Reeves' achievements is the conception of the direct current interlocking motor, which has proved so successful that many of the large studios are employing the development for location work.

Among the devices to be put on the market at the new quarters is an optical unit for recording sound on film which will give a line of light on the stock so fine and so accurate that recording has been accomplished up to 25,000 cycles. This optical equipment will accompany each outfit that is sold, with an accompanying guarantee of 10,000 cycles range.

Mitchell Announces New News Camera

THE NEW Mitchell Silent camera, which was described in the August issue of the AMERICAN CINEMATOGRAPHER, has since that time been modified for use in newsreel and commercial work. The camera and its mechanism are basically no different from the regular studio design described at that time. However, the four lens turret, which was eliminated in the new studio model, has been retained in the new newsreel camera. The camera is also operated by a direct current motor, such as is used in most portable recording equipments, and is supplied with a tachometer. The design is such that the new camera may be used with any of the many portable recording devices now available, as well as with the small sound-truck units generally used by the larger newsreel firms. Either single or double film recording systems may be used.

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ANNOUNCEMENT

BEGINNING with the October issue, a pictorial section will be found each month in the American Cinematographer. In this section we hope to reproduce the finest collection of pictures to be found in any photographic journal.

In order to stimulate interest among members of the photographic craft, the American Cinematographer offers three prizes for pictures appearing in this section during the twelve months starting with the October, 1931, issue. Three impartial judges will decide on the winning pictures, and the awards will be made and announced in the November, 1932, issue of the Cinematographer.

Prizes will be—\$100.00 for the first award. \$50.00 for the second award. \$25.00 for the third award.

This section is open to any bona fide subscriber to the American Cinematographer. Amateurs and professionals have the same opportunity. No one is barred. All that is necessary is that you be a paid up subscriber to the Cinematographer.

Only 8 by 10 or 11 by 14 prints will be considered. They may be on glossy paper or dull finish.

The names of the judges will be announced at a later date.

When sending your pictures take every precaution in wrapping so they will not be mutilated in the mail. The American Cinematographer will take all precaution in handling the pictures in order to keep them in excellent condition. However, this magazine will not assume responsibility for any pictures it receives, and will not be held responsible for loss or damage to prints.

Amateur Movie Making

by WILLIAM STULL, A. S. C.

MR. JESSE S. COHEN, of Brooklyn, N. Y., is an amateur cinematographer, a reader of THE AMERICAN CINEMATOGRAPHER, and a very positive-minded individual, to boot. A few days ago he wrote us to appraise us of some of the shortcomings of this department. This is not particularly unusual, for no magazine can escape criticism from its readers; but Mr. Cohen is unusual, for he criticized it constructively. He knew what he wanted, and told us about it. Furthermore, he sent us some samples of his work, and asked us to criticize his lightings. He says, "For example . . . you might criticize the following two lightings. I know they're wrong—I knew it as soon as I saw them on the screen—but what can I do about it? For example, take the following close-up (Figures 1 and 2). Well, you can tell at a glance what I had to see on the screen—it's flat. There's no detail in the faces because there's no play of light and shade. How would you light that?"



Fig. 2

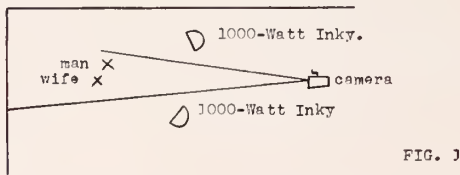


FIG. 1

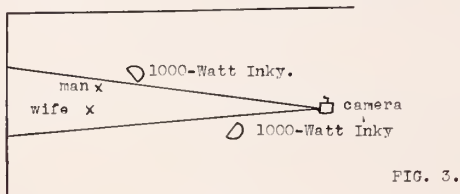


FIG. 3.

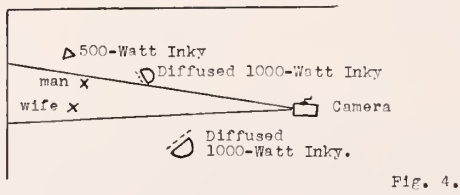


Fig. 4.

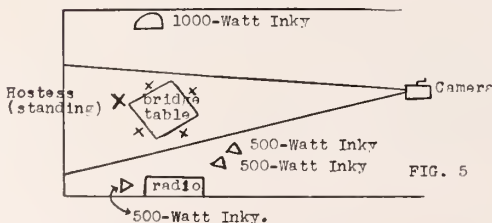


FIG. 5

Mr. Cohen hit the nail squarely on the head; his picture is flat because there's no play of light and shade, or, to put it the other way, because there's no play of light and shade, his picture is flat. He obviously had not realized that there must be two sides to everything—especially lightings. There should be a shadow side and a high-light side. And unless

you want an extreme "Rembrandt lighting," which has detail only in the high-light side, with jet-black shadows, the shadow side should not be absolutely shadow, but lit to about half the intensity of the high-light side. Mr. Cohen's scene is flat because both sides are almost identically illuminated.

There are many things which can be done to improve such a scene. The simplest thing would be to move one light closer in, and the other quite a bit farther out. (Figure 3). That would give the proper balance between the shadow and high-light sides. Or, you might put a diffuser on whichever of the two lights was illuminating the side chosen for the shadow side. A diffuser is easily made; it is simply a screen of muslin or tracing-cloth stretched over a frame that can be hooked over the front of the lamp.

Still another expedient would be to bring the left-hand light as close to the centre as possible, and close to the subjects, and to place the right-hand lamp beside the man, and a bit to the rear, in order to secure a back-light effect. An even better lighting of this type would be to use the two 1000-Watt Inkies somewhat as Mr. Cohen did, but with the right-hand one quite a bit closer in and a bit to the side, and the left-hand one carried back a bit, and both with diffusers. Then, an undiffused 500-Watt lamp used as a back-light would complete the set-up. (Figure 4).

Lighting a Long-Shot

Returning again to Mr. Cohen's letter, he says, "I was disgusted at that one so I got a few smaller light units. For a bridge-party scene I made the following set-up. (Fig. 5). The result here was worse. The space in front of the players was underexposed—black, in fact. The face of the hostess, standing, was overexposed, a blank, white area. The result cannot be blamed on the limitations of the reversal process as DuPont Panchromatic negative stock was used and processed in the usual manner of the professional."

I'm afraid that here I cannot agree with Mr. Cohen. His arrangement of the lights shows considerable improvement. He is on the right track, too, in using several, smaller units for illuminating his long-shots rather than a few large ones. But I do not feel that he is on the right track in his desire

(Continued on Page 37)

Cutting the Cost of Amateur Filming

by J. P. LAWRIE

FROM the beginning of summer and onwards, sometimes even well into the winter, the correspondence columns of the popular and serious photographic press are enlivened by a snowball series of howls from the users of sub-standard cameras.

These letters, from folks who declare that their hobby and pastime of movie making is curtailed by the exorbitant cost of the sub-standard films, have had, and will have, but little effect upon the makers of the film. In these days of so very keen competition the manufacturer who could profitably reduce his prices would—there is no doubt of that.

A brief survey of the situation reveals the easily seen fact that the cost of sub-standard film not only limits the activities of many movie camera owners, but seriously limits the number of people owning such cameras. (This point strengthens the above statement re makers reducing prices if possible.) On the contrary, the number of projector owners is legion.

Therefore, until a wave of national prosperity so enlivens the sale of films and cameras, or new methods of manufacture enable the makers to reduce prices, owners of home movie cameras must put up with the cost of film and determine to run the apparatus as economically as possible.

The obvious ways of economy lie, of course, in expert handling of the camera, in elimination of unnecessary shots, the limiting of footage to various scenes and titles, etc., etc. The not quite so obvious ways of cost reduction come to light when thought is applied to the subject and the resultant ideas put into practice.

Despite the most careful and economical handling of the camera, the expense of filming will remain, for the average purse, fairly high. The only way to reduce this is to make the camera earn its keep.

The means of accomplishing this are many and varied, for instance in the summer (or what passes for it) many owners of projectors would more than welcome a film taken on one of their days in the garden, on the river, tea fight, or race meeting, etc., would cheerfully invite the camera owner to such an affair and pay well for the completed picture.

Many special events at the houses of the great and/or wealthy would produce quite good profits, an eye kept on the local paper will inform one of the people, place and time. The novelty of the idea will appeal greatly to the host and the odds are that interested guests who happen to be well featured in the film will become desirous of copies. There is, of course, always the possibility of a fair return from the sale of passable "Stills" from these films.

Again, many business houses would respond to the suggestion that a film be made of one or more of their processes, a view of their offices and factories, etc. One can quite anticipate that the big boss of the place has a projector of his own, and a few feet exposed whilst he deals with big business in the office will flatter his vanity and prove a sure seller, bringing relatively large profits to the enterprising camera man.

If the big boss hasn't a projector, maybe your suggestion of a film will interest him. Now here is profit for you if you can tie up with the local dealer and pull off a few sales. By the way, you need have no hesitation or doubt when pushing forth the idea of making a film, whether it be to police, business or professional men, military or drapers—**everyone** is interested in films, and it's a subject you know, or you'd not be keen on it!

Have you explored the possibilities of your own camera and projector combined when you hunt the elusive £.S.D? Can you see profit in taking a few feet of the crowd fighting to get into Blanks the Drapers at sale time, fixing up the film as a continuous band, adapting the projector and hiring it, with the film and screen to Mr. Blank for a while? Tell Blank to display it in a window suitably equipped with peep-holes to view. If you let the crowd see you take the film, Blank's publicity is assured as is a handsome recompense for you!

A little thing will produce a flood of such really workable ideas. Here are a few suggestions which can be followed up, and which will doubtless suggest other and better things to do.

A film of the local M. P. spouting at an open-air meeting will be a sure seller to him (idea, keep the camera busy during elections!) Attend wedding, funerals (be careful here) and the local Chief of Police reviewing the constabulary. The fire brigade put up a good show at times and there are always local processions, fetes, etc. You may be sure that one or the other of the leading lights of these kindred affairs has a projector, in any case it is well worth asking.

Have you a Territorial camp near you this summer? If so, interview the C. O. get shots of the Church Parade, the Field Day, Sports Day and the grand inspection by the visiting General. Secure a few feet of Kit inspections, potato peelers, etc., in fact cover every aspect of camp life, not forgetting humor whenever possible. Edit this carefully and produce the finished film showing the life of a soldier at camp. You are certain of selling this to the Commanding Officers as a recruiting film. Odd bits such as the top company changing guard, etc., can be sold to the various platoons. Any good "Stills" you can show will sell like wildfire to the troops

Furthermore, you are almost certain to be commissioned to project the film at various times—usually at dinners, suppers and dances. Rather nice, isn't it—a jolly army "do" and ten or twenty shillings in your pocket afterwards!

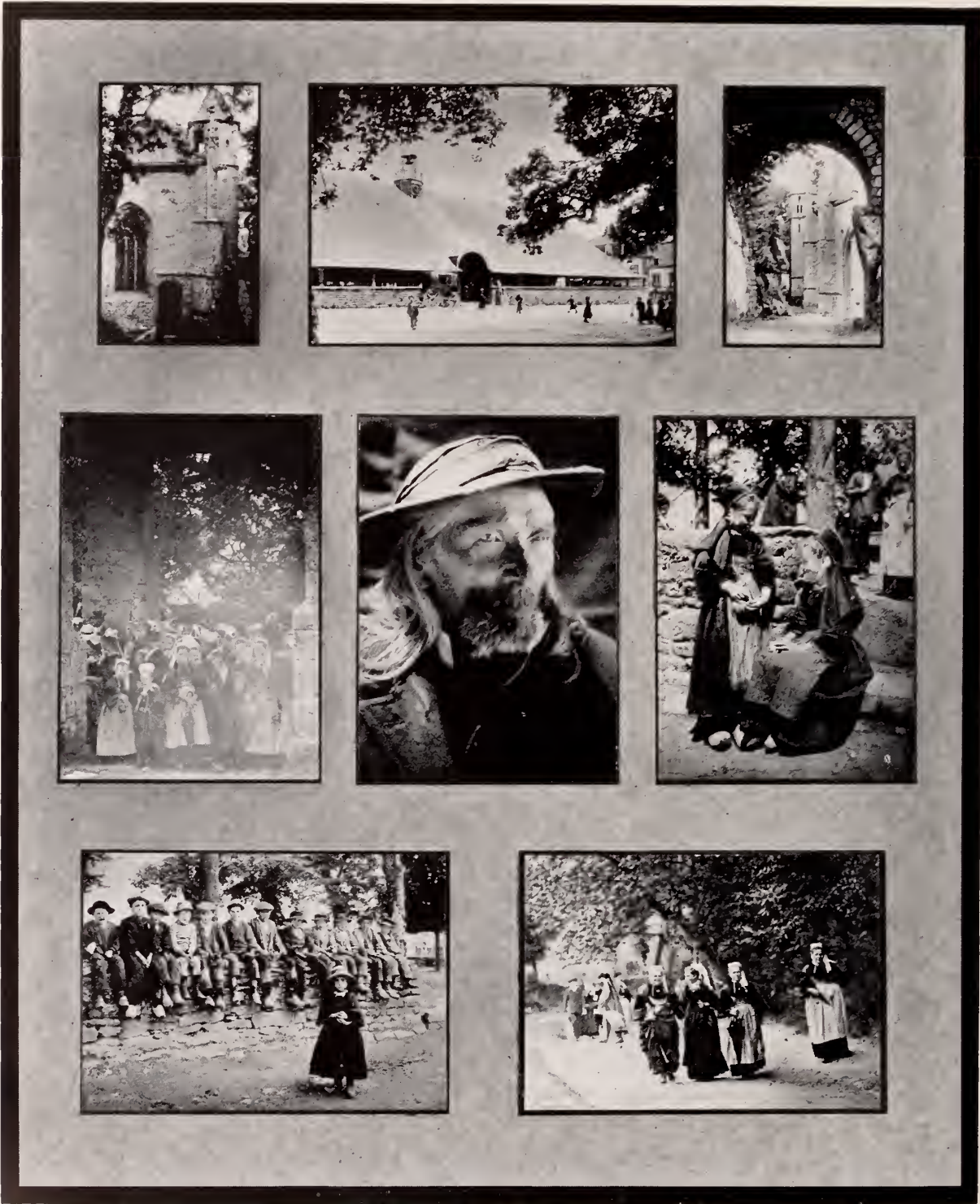
And the result of all these efforts? Why, greater skill in your movie camera craft, better ability in seeing pictures that tell, and last, but not least, a very substantial cash balance to help your own movie expenses.

Of the friends you will meet, of the good times you will have, of your greater interests and joy of living, on these items one can put no price.

Filmo Topics

THE amateur movie maker will always find much of interest in Bell & Howell's clever little publication, Filmo Topics, which that organization issues monthly in the interest of users of 16 millimeter equipment. This magazine will be sent you free if you write The Bell & Howell Co. at 1848 Larchmont Ave., Chicago, Ill. In the September issue will be found:

Editing Your Summer Films;
Helps in Scene-Planning. Advance preparations which insure better travel films;
Magic Wishes. A child film scenario of simple stopmotion trick work;
Stills From Your Vacation Films;
Filmo News Pictorial;
Seasonable Hints Department;
Contributor's Column.



Upper left, St. Barbe; upper center, Market Hall, Le Fauet; upper right, St. Barbe; left center, Shelter in the Belfry; center, A "vieillard" known to all artists; right center, Discussing the future of the race; lower left, Who said "Man shortage?"; lower right, Returning from the "Pardon".

Babbling About Brittany

by LAWRENCE GRANT

This is the sixth article of an unusually interesting series which Mr. Grant has written for this magazine. The next will appear in the October issue.—Editor's Note.

LE FAOUCET. Now just how do you think we are going to pronounce that? I feel sure that most of us are going to be deceived, that we shall drop the final T, believing it to be silent, and say "Le Fah-oo-a." This is one of those words with which the French catch the unwary, like the words:—"dot" and "lot" for we must say:—"Le Fah-oo-ette" and the final syllable just as the English insist on pronouncing the simple word "ate." They do not say "ate" as we do over here, and as it would seem to be natural to do, they say "et,"—just that. And I have found a reason for this, for if they were to say: "I ate it," they might be suspected of registering an aitchless dislike for food, so to avoid misunderstanding they say—"I et it." Philologically wrong—but the meaning remains clear.

To get here from our last resting place we should really have gone all round Finisterre and through Quimperle and Concarneau first, but we had to take a flying trip down here to be in time for the "pardon" of Ste. Barbe. It occurs on the last day of each June and should not be missed.

We saw laundry work done in the river at Lamballe, but I forgot to say in the last chapter that, at Locronan, they wash their linen in St. Ronan's Well. It is also a place for prayer. You can purify soul and linen simultaneously—this combination of the religious and mundane matters is not infrequent in Brittany.

Ever hear of the woman who had a Bishop as a week-end guest? At the time of his first breakfast with her he expressed his gratification in having heard her singing "Nearer, my God, to Thee," while preparing the meal, and congratulated her on beginning the day in such a devotional spirit. "O, yes," she replied, "I always do that when we have eggs for breakfast, two verses for soft boiled, three for hard."

On the day of the "Pardon" deputations from outlying villages carrying Crucifixes and Banners begin arriving in the square from an early hour in the morning. A group of Locronan priests and choir receive them, and greet them by touching Crucifixes lightly together, while a thurifer swings a censer and a priest speaks a welcome, and the choir chants the "Brittany hymn." Very attractive is this old custom. I saw nothing like it elsewhere.

Now here you can see why I chose the title for these ramblings,—I am not tied down to any rules, literary, geographic or chronological. If I forget something I can dart back to it at anytime later on when it occurs to me.

I ought to have said in the first chapter I suppose that the reply to so many people who ask why it is called "Brittany," a name so like "Britain," is that, while originally it was "Armorique" or "Armorica," about the fifteenth century (I think) many Celts came over from Britain and settled, so the name became Brittany.

But "revenons a nos moutons," or, let us leave Locronan and get back to Le Faouet:—and to "Veuve Couillard" "Proprietaire de l'Hotel de la Croix d'Or et des Touristes. Chambre noire pour photographe; ateliers pour artistes peintres; salles de bains avec douche:—Telephone; numero Le Faouet 3;—Recommande du Touring Club de France."

"Veuve Couillard" may I bracket you with another "veuve"—"Veuve Clicquot" for surely your "souffle au fromage" is as light and frothy and delectable a thing as her best years vintage. The one a compliment and complement to the other.

Dear old widow, I salute you, even though I fear I should add R.I.P. for you were old when I knew you.

I look at my "addition" written in your own angular hand writing and I find myself naively described thus:—

"Hotel de la Croix d'Or"

M. Chambre no: 15.....doit.
and the daily figures thus:—

1 chambre	2.50
1 petit dejeuner en chambre.....	1
1 dejeuner	2.50
1 diner	3

Frcs 9

Less than \$2 a day when the franc was only 20 cents!

You blessed old souls, and some young, of the French village Inns, both "veuves" and "mariees" are any of you left in your simplicity and adorable hospitality—even though it be dispensed at a price which you jealously look after.

Mere Poulard at Mont St. Michel;

Veuve Couillard at Le Faouet.

Madame "Julia" at Pont Aven.

Veuve Daniel at Guingamp.

Hays-Cogneau. (Friend of Sarah Bernhardt) at Auray.

Laurent at Rosporden.

These come to my mind at random. If I should go to a strange village and find two hotels, one with a "veuve" in charge and one with a "patron" I should, without disparagement to "Monsieur," unhesitatingly select the one with the lady in charge.

A book should be written on these women, but this is beyond babbling and sounds like anecdote.

At Le Faouet is, I believe, the finest market hall in Brittany. I hope it is being properly preserved, it was perfect when I saw it, but just ready for restoration if it was to be kept in first class condition.

Its proportions are so splendid as to be an eternal joy to architects and artists, its wood work and "joinery" a lesson to carpenter-builders; its position in the great square a model for City planners, and the costumes of the crowds, and the colors of the fruit and vegetables on market day a delight to the eye.

Market day at Le Faouet is a lovely scene, and many French and English artists have immortalized its beauty.

There is great difference between summer and winter costume. The winter cap is shaped like a judge's or an advocate's. The material always black, and the back part continuing down over the shoulders into a three cornered cape which protects from wind and rain.

In the coming generation there would seem to be no danger of "man shortage" in this district, at least as far as one girl is concerned. Note the apple in the hand of Eve, and the line of waiting lads. "The line forms on the right."

St. Barbe is about two kilometers walk from the hotel. The black face mean that you really do walk because there is no other way of going up and down the dales and woods to the hill top where the chapel is.

Who would want any other way? In the morning you are up early-ish and chatter and exchange news with other walkers all the way; and in the twilight evening you have found someone to stroll back with in the dark woods where the moonlight can't penetrate and then there is no need or desire to hurry!

The "Guide Joanne" says:—"On sort du Faouet par une ruelle qui s'ouvre au N. de la Place des Halles (a la maison d'angle, Statuette de la Vierge." If the Virgin were removed by the house owners the instructions would be as useless as a road sign was in England.

In 1922 some Americans touring in England and on the way to Mere-on-the-Ouse-by-Little-Moseley found a sign at a cross road which said Mere-etc.-etc. was 5 miles away and it pointed to the left. So they went that way and when their speedometer registered 6 miles they asked a yokel what was wrong. "O," said he, "Mere-etc.-etc. is 11 miles in the other direction."

But they told him that the sign post pointed this way. "O," laughed he in glee and in answer, "that catches many a visitor, that does. Y'see we turned it the wrong way during the war to deceive the Germans, and we ain't got round to putting it back yet."

However, the guide goes on—"qui descende dans un ravin, il remonte ensuite—traversant tout droit la plateau—on arrive—a la maison du gardien—qui a les clefs de la chapelle. (pour-boire.)

(**Pourboire**). That's what I was coming to. Isn't that nice? You are not in any doubt. You do not feel any delicacy in this matter. You are not terrified of hurting the feelings of the last of a long line of Breton knights in armour. A tip is in order. A tip is expected. A tip is the thing to do. In fact it practically says—"No tip—no Clefs."

This "gardien" is a well-known character. He is chapel sacristan. He is a linen weaver. He weaves that lovely coarse pale buff colored linen from which "Brag-o'-bras" and the table cloths such as those used at the Riverside Inn in California are made. He also spins yarns to all who will listen. He is an artist's model. And on "Pardon" days he turns his place into a restaurant. His loom is a lovely thing. His linen perfect. He shares the rooms, while working, with his poultry who hop about from beam to beam of the loom, and from warp to woof of his linen, crowing, cackling, and behaving in other and more embarrassing ways round and on his machine and his product; and with his two pigs grunting and sleeping at his feet.

Pausing now and then to light and smoke his pipe. Do look at the pipe. The briar beside it is rather a small ordinary American pipe. The Brittany pipe is of black clay, three and a half inches long, and the bowl just large enough to make a cigarette holder. Smoked as they do, it holds about five good draws of tobacco.

Just beyond is the Church, only just visible though, for it is built below on the side of the hill, and the steeple or tower is only the height of the plateau of the hill.

There is always some reason for these remote churches and their frequent peculiar location or manner of building.

This is erected on the side of a mountain near the top because in 1489 the Lord of Tolboudeu when hunting was overtaken by a storm. Above him an enormous piece of rock loosened by the rain started rolling down towards him. He hastily prayed to Ste. Barbe to save him and promised to build a chapel in her honor on the spot of he lived. Instantly the descent of the rock was arrested, caught by some tree trunks.

He more than faithfully fulfilled his vow. The Church is lovely.

On Pardon days they still sing his prayer:—

"Ste. Barbe et Ste. Claire,
Preservez moi de la tonnerre;

Si la tonnerre tombe.

Qu'il ne tombe pas sur moi."

There is a lovely flight of wide stone steps leading from the mountain plateau to the church. Quite the architectural beauty of the place.

At Le Faouet in the little general store I wished to buy some picture postcards of this. None was there, though some of every other spot. Why? Well, she did use to have them, but they went so quick it was not worth while ordering them! Quaint idea of doing business. But in 1918 I went into a big drug store in Sacramento, Calif., U.S.A. at 7:30 one Saturday evening to buy three cans of canned heat of a well known brand. And the proprietor said to me seriously as follows:—"We have none left. If you want to make sure of getting them you will have to come in the early part of the day. We are sold out of them every Saturday about five o'clock." (Ripley, I pledge my word to the truth of this story, word for word.) Now was there any difference in the business mentality of the old woman and the modern man?

It rained and rained on this particular Pardon day. The climate of Brittany makes England seem dry. And I had to use cameras under an umbrella all the time. The majority of readers of this particular magazine will know that while I made quite good motion pictures under such conditions, still photography suffers very much.

The reason, for those who do not know, one is projected and has the powerful light to give it contrast and brilliance from reflected rain drops, etc. The other has no help from the paper print.

Off to Baud for the Pardon of Notre Dame de la Clarte with bonfires everywhere. Very picturesque, but need not linger on it, I have briefly referred to many as we came along in these babblings, but am reserving more detail about them till we come to the last and best at St. Anne d'Auray, and anyhow, here at Baud there is something far more alluring, a little place, so little that I have never yet met anyone among my friends who has discovered it, though of course some enterprising souls do find it, yet it possesses by far the most interesting and unusual Saint, if Saint she can be called, in the whole of Brittany, and probably in all France.

For, after being saturated, almost satiated with Christian cathedrals and Saints and Holy relics, here we are confronted with frank and unabashed Paganism.

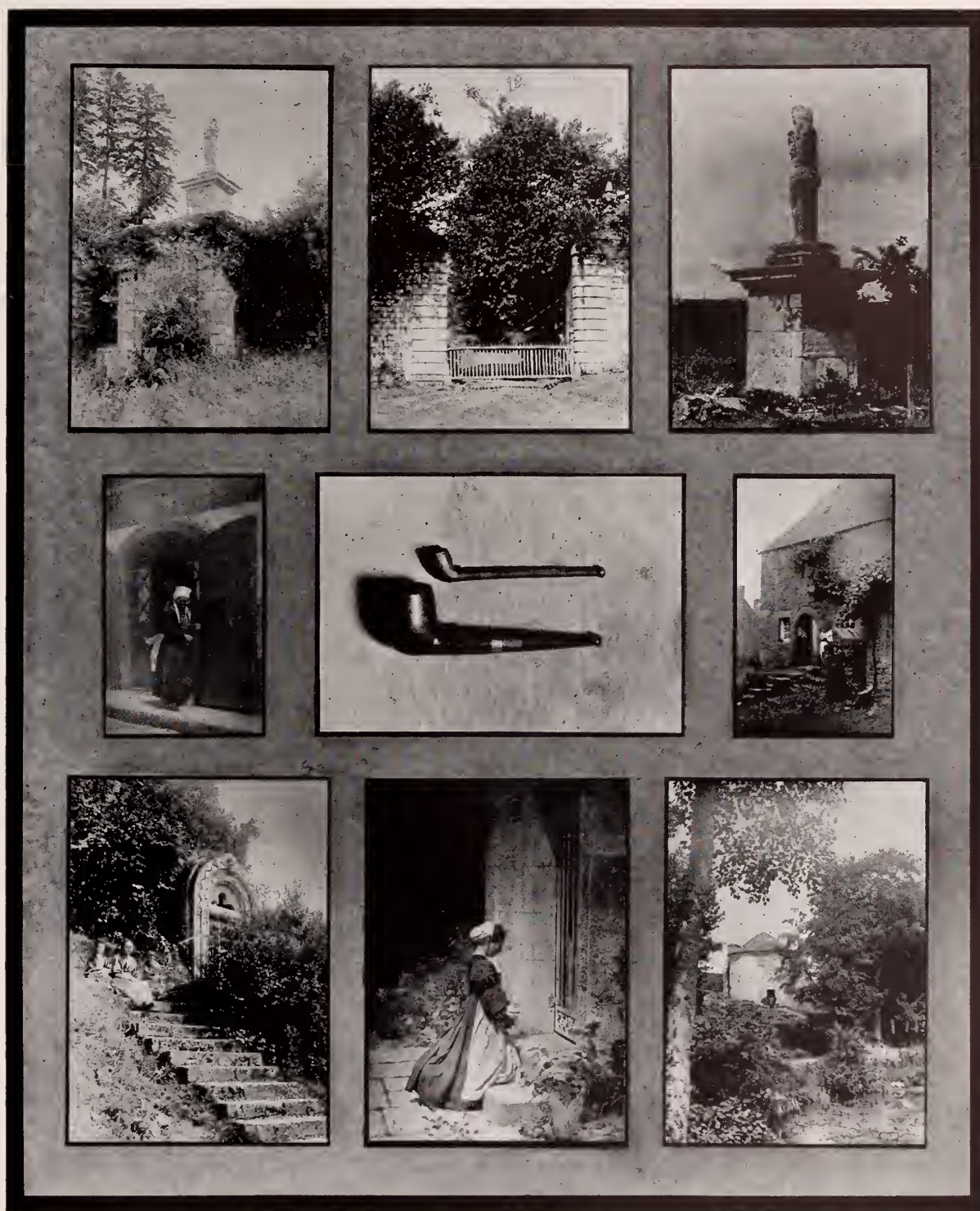
Standing high on a hill, above an orchard, as befits her name and reputation, is a statue of no heroine of history, no Saint of Holy Church, but Venus herself. The Goddess Of Love, none other, not even masquerading under any euphemistic name, but boldly and shamelessly known as;—"La Venus de Quinipilly."

Actual origin unknown. Frankly pagan, yes. This statue, or one similar, has stood here from time beyond any local record of origin. The statue you gaze on now is not the original. The ecclesiastical authorities did not approve of the original, and though there is no exact knowledge of what it was like, sufficient is known to understand that it was an offence to clerical eyes, however alluring to the younger set. The clerics, afraid to forcibly remove a figure so ancient or so venerated, caused it to be surreptitiously thrown off its pedestal from time to time. But each time the peasants put it back. Broken a little more at each fall, it finally became a wreck. But in such esteem was it held, especially by young women just married, that when it was hopeless to try to replace the original, they had another made. This, as our "Guide" says discreetly, was no doubt "un peu modifiée" from the old one, and so the Clergy let it stay.

It is an Egyptian figure representing Isis, a Venus of really more reprehensible attainments and character than the Latin Goddess.

She presides over human fertility. To her garden come her suppliants at night. They stay all night. They lave themselves

(Continued on Page 45)



Upper left, La Venus de Quinipilly; upper center, Entrance to Her apple orchard; upper right, Aphrodite herself; left center, "Who said camera?"; center, An ordinary pipe and A Brittany clay; right center, The Women and the Well; lower left, La Vierge de la Roche; lower center, La petite Devouee; lower right, No good as a windmill, but makes a lovely cottage.

The "Little Fellow"

(Continued from Page 17)

jubilantly returned—blissfully ignorant of the fact that each had bought the other's cast-off printer!

Our studio equipment—and the "studios" themselves—were equally amazing. The first studio (what a pretentious name for such a place!) was a room twelve feet wide, by twenty-five feet long. Our lighting equipment consisted of two 60-Amp. arcs, which we ran, perforce, on Alternating Current. The sets were painted canvas "flats". We would start in the morning making long-shots on one set, and then, as we required other sets, we would move them in front of the first one, until by nightfall we were making closeups, with the room jammed full of "sets". For real "production value" we would sometimes manage to wangle our way into some private home. A few years later we managed to get a slightly larger barn for our studio, and to get more lighting equipment: two more arcs, and a spot light. A **real** spot light! How proud we were of it!

Actors were another problem. We had to use whatever we could pick up locally. Usually, they were none too capable; even the best ones would hardly give a Hollywood extra anything to worry about. As a rule, we would just get our people trained to the point where they were not too obviously bad—and then we'd have to stop using them because of the frequency with which they had appeared.

From all of this it might be guessed that the commercial film business was rather precarious. It was! How some of us managed to survive will always be a mystery to me—but we did it, somehow. Our chief revenue came from making short advertising films for the local emporiums. Some of us made local newsreel supplements for the local theatres or newspapers. Sometimes we would manage to land an order from some big local firm, like a railroad or oil company, for a reel or two. Once in a while we might make a few hundred feet of personal films—such as one does now with one's own cine Kodak—for a local millionaire. A few of us, greatly daring, would occasionally promote the making of a two-reel home talent movie, sponsored by some theatre, or paper, or the like. All of us optimistically "covered" every event that might possibly be of national interest or importance, with the hope that the national newsreels might use it; even if they didn't, they'd return the developed negative to us, saving us that expense! And a few of us—the luckiest—might actually be on the staff of some newsreel as the local representative.

But, principally, our work was making ad films for the local merchants. We went about it this way: we would contact with the theatre-managers for the use of their screens for advertising. Then we would approach the merchants, and contract with them to make film ads for them, to be shown in the theatres we supplied. Then we made the films. They were not what you could call tactful, sugar-coated advertising. They couldn't be, for they only ran about fifty seconds each! At first, we would use as many of these units as possible; later we restricted them to about half a dozen or so—and raised our prices for this refinement.

During the last few years, tremendous changes have taken place in the industrial end of the film business just as they have in the studio world. Perhaps the most important of these changes have been the consolidations, mergers, and new capital which have greatly benefited many of the industrial firms. Then there has been the advent of sound. This has spurred the mergers, because of the cost of sound equipment and sound production, which is too great to be borne by a small outfit. Furthermore, it has introduced technical and artistic problems that are not even solved yet. The running time of these ads—seldom more than a minute—is hardly adaptable to the use of dialog. On the other hand, it is difficult to make them longer without running the risk of arousing public resentment. So at present we are making our films

short and to the point, beginning each reel with a sound entertainment short, into the middle of which we work our ads, with the music or dialog of the first part continuing under it, and then ending with the finish of the entertainment part. Due to the nature of our ads, we usually record our sound on film, which makes it easier to dub in on our ads.

The firm with which I am now connected, the M.P.A. Studios, of New Orleans, is quite typical of the larger, present day commercial film firms, though there still exist many of the independent "little fellows". Our firm does business all over the country. We have really modern equipment—Bell & Howell and Mitchell cameras, Mazda lights, and a stage almost as large as one of those used in Hollywood. Our sets are no longer painted drops, but well constructed settings. Our lights and lightings are beginning to compare quite favorably with those of Hollywood. Our sound, though very rarely recorded at the same time as the picture is made, as we use synchronized narrative and musical accompaniments almost exclusively, is surprisingly good. In short, we are getting to a point where we can really turn out films of professional quality.

The latest development is the change to natural color exclusively. Color has been found to enhance the appeal of our films tremendously. Now that there are color processes all over the country commercially available, at reasonable cost, and capable of really good results, the industrial producer should, by all odds, take advantage of the increased appeal that they give.

So, although the "little fellow" still exists, his prospects are steadily brightening, and he is slowly drawing nearer to his rich relative, the "big fellow" of the Hollywood studios.



Vitaglo Corporation Offers Excellent Facilities for Making Talking Pictures in Chicago Studio

STARTING not so long ago in the business of manufacturing portable sound equipment, the Vitaglo Corporation of Chicago now has turned to the active production of commercial motion pictures; and according to this company's very attractive brochure, is prepared not only to do all kinds of commercial work, but is ably fitted to make special scenes for New York or Hollywood producers who want to make certain sequences in and around Chicago.

The Vitaglo studios, according to the announcement, are adequately sound-proofed, making possible the making of pictures of as fine a quality as in any studio on the East or West coast. The lighting equipment consists of 35 units with a total of approximately 300,000 watts. A complete carpenter shop is prepared to construct desired sets; completely outfitted dressing rooms are provided for players; a projection room with complete sound equipment is available, and one day emergency service is guaranteed. The studio is also equipped to furnish natural color along with sound, and has its own developing and printing laboratory. A complete staff of cameramen and sound technicians is maintained, and Mr. A. B. Chereton, of the Vitaglo organization, claims they have the best equipped studio between New York and Hollywood.



Society of Motion Picture Engineers to Hold Fall Meeting at Swampscott, Mass., Oct. 5 to 8

THE fall meeting of the Society of Motion Picture Engineers will be held at the New Ocean House, Swampscott, Mass., October 5 to 8, according to an announcement made by the Board of Governors following its meeting held in Schenectady last month.

Amateur Movie Making

(Continued from Page 30)

for greater illumination—and detail—in the foreground. To me, the important action of the scene is that which takes place on the bridge-table; and all the unessential details of the mass of chair, table, and feminine legs in the foreground would tend to distract attention from this more important part of the picture. In addition, the dark foreground contrasting with the well-illuminated middle and backgrounds, gives an illusion of depth to the picture. Still, if one does want this foreground detail, the only way to get it is to put more light onto it. Of course, the way one would do this would naturally be dictated by the equipment available. Perhaps the easiest way to do in this case would be to add one 500-Watt lamp on the right-hand side, as close to the centre as possible, and placed rather low down. One of the pair of 500-Watt lamps at the left front could also be placed low, to good effect. Then, with more light on the foreground, the scene could be printed lighter, and the high-lights on the hostess' face would not be so washed out.

Faster Film

Another great help in this type of work is the use of the new Fast Film. With it, a much larger area can be illuminated with the same amount of lighting equipment; furthermore, the more sensitive emulsion can utilize the spilled light which the older film wastes. For the professional, spilled light is often quite a problem, but for the amateur, it can be a great help, as it can be used to lighten otherwise unrelieved shadows. Most amateurs are by now probably quite familiar with Fast Film in its reversal form—the Eastman Super-sensitive reversal stock; but many of them are quite unaware that it is likewise available in 16 mm. negative form—the DuPont 16 mm. Special Panchromatic Negative. This is coated with the identical "Fast" Panchromatic emulsion with which the DuPont 35 mm. "Special" (or Fast) Panchromatic negative used in the studios is coated.

In addition to the faster film, faster lenses are always beneficial to interior workers. Mr. Cohen's camera, like most of the early Victors, is probably fitted with an f:3.5 lens. This is all right for exterior use, but for interiors a faster lens—say f:2.5 or f:1.9—is not only useful, but almost essential. With the faster films now available, and the amount of lighting equipment that Mr. Cohen has used, f:3.5 is quite alright for close-ups and medium shots; but for such shots, with fewer units, or for long-shots covering larger areas, the faster lenses are essential, for they only are able to fully utilize all the light falling on the scene. Furthermore, the combination of fast film and fast lenses makes it possible to use the ordinary house lights for additional lighting effects. With this combination of lens and emulsion, it is uncanny what can be accomplished with only a few ordinary 50-Watt or 100-Watt bulbs, while with slightly large ones—200-Watts or thereabouts—the possibilities are tremendously increased, and when these are combined with several of the regular 500-Watt and 1000-Watt home movie lighting units, almost anything is possible.

25 Years of Progress

SEPTEMBER, 1931, is a month that means much to the C. P. Goerz American Optical Company, and we are pleased to print the following message from that organization:

"This month, the C. P. Goerz American Optical Co. celebrates the 25th Anniversary of its incorporation as an American manufacturing concern and takes this opportunity to thank its numerous clients for their consistent and unwavering support.

"Established in 1895 as an American branch of the famous C. P. Goerz Optical Co., of Germany, the manufacture of these celebrated lenses in the United States commenced in 1898. Thru its incorporation under an American Charter, in 1906, it became definitely established as an American business.

"Thruout this period, there has existed in the management, in the executive staff, in the workers, the deep-rooted conviction that an optical business to succeed must necessarily be more than a mere business enterprise—that it must be inspired by high ideals of workmanship—by standards of endeavor which due to the nature and difficulties inherent in scientific manufacturing, must be precise and inflexible.

"A lens is frequently a life-time possession. Its defects are a constant source of annoyance; its fine qualities assure lasting gratification. Bearing these facts in mind, the C. P. Goerz American Optical Co. has ever been the severest critic of its own work, subjecting its entire output of lenses and optical instruments to a rigid inspection and rejecting any constituent part which thru some flaw in raw material or defect in construction, could not come up to preconceived standards.

"With every assurance that this policy inaugurated 35 years ago and adhered to until the present time, will be continued in the future, we again thank our clients for that fine co-operation which has made our success possible."



Who's Next?

THE FOLLOWING letter speaks for itself. If anyone can bring on a smaller house, let him come:

Hal Hall, Editor,
American Cinematographer,
1222 Guaranty Bldg.,
Hollywood, Cal.
Dear Mr. Hall:

I just happened to be looking over some of my back numbers of the CINEMATOGRAPHER, when, in the November, 1930 issue, I came across an article whereby L. C. Pearson of the Northern Electric Company had discovered the smallest talkie house. The theatre seats 240.

If I may make a correction, I wish to say that this theatre, which is in Canada, is NOT the smallest. For I own and operate a talkie house that seats only 155 in a building which is 25 ft. wide by 50 ft. long. I run the best talking pictures every other night on Chamberlain Sound equipment, which is manufactured in San Francisco.

Hoping that this may be of some interest to you, I am,

Very sincerely yours,

GOLDEN BEAR THEATRE

Pine Crest, Cal.

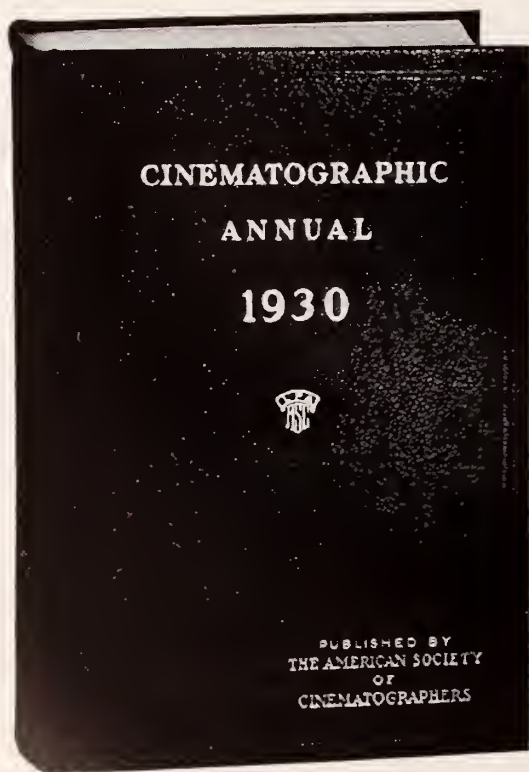
By Richard L. Bare

Manager.

A personal advertisement in the Cinematographic Annual will be read all over the world.

There is still time to reserve your space—do it today.

The Last Word for Professionals or Amateurs..*the* CINEMATOGRAPHIC ANNUAL



Compiled and Published by

**The American Society of
Cinematographers**

Hollywood, California

A book valuable to everybody directly or indirectly interested in the Motion Picture Industry . . . Production, Photography, Exhibition, Sound Laboratory, Color Effects . . . A wealth of facts and statistics such as can be found nowhere else . . . forcefully written by Master Technicians and recognized authorities . . . has a definite place in the Library of all Production and Distribution Executives, Directors, Writers, Technicians, Sound and Lighting Engineers, Editors, Photographers, Laboratory Directors and Home Movie Makers.

\$5.00 per copy

Beautifully bound in Blue and Gold. 675 pages
Postage prepaid anywhere in the World

AMERICAN SOCIETY OF CINEMATOPGRAPHERS,
1222 Guaranty Building, Hollywood, California.

Gentlemen: Enclosed please find check (or money order) for Five Dollars (\$5.00) for which please send me prepaid, one copy of your Cinematographic Annual.

Name _____

Address _____

City _____

State _____

Special Filmo Camera Model for Golf Pictures

A SPECIAL Filmo movie camera for taking golf pictures for instructional purposes is announced by the Bell & Howell Company. This camera, which is known as Filmo 70-DB, has seven speeds—8, 12, 16, 24, 32, 48 and 64 frames per second—and is the same as Filmo Camera 70-D except that it has a shutter opening of 110 degrees instead of 216.

"The advantage of this new Filmo model", says the announcement, "lies in the fact that normal speed and slow motion golf pictures can be taken with the same camera. In teaching golf by motion pictures it is essential that the golf stroke be taken by slow motion in order properly to analyze a stroke and determine just what are the good and bad points. It is also highly important that shots of a player in action should be taken at the normal speed of 16 frames per second in order to see his plays as they ordinarily appear. Other speeds, such as 8, 24, etc., are desirable for certain special purposes, but normal and slow motion pictures are of prime importance.

"For slow motion analysis a speed of 64 frames with the ordinary Filmo 70-D shutter opening of 216 degrees is entirely satisfactory except that pictures taken at the bottom of the stroke when the club is moving rapidly tend to blur. The new Filmo model entirely overcomes this. The 110 degree shutter opening "stops" the action of the golf stroke with the clearness of a slow motion camera taking 128 pictures a second. A special model Filmo camera is available which takes pictures at 128 speed only but does not take pictures at normal speed. The new 70-DB Filmo, by making it possible to take both slow and normal speed pictures with the same camera, renders it unnecessary to use two different cameras.

"The new model Filmo at 64 speed uses only half the film employed when pictures are taken at 128 frames, and any unusual light requirements due to cutting down the shutter opening can be easily taken care of by employing the new supersensitive film, although ordinarily this new film will not be necessary.

"When using the 70-DB Filmo at 64 speed on a bright sunny day during the summer months, between the hours of 9 A. M. and 4 P. M., the lens can be set at F 4 with regular panchromatic film and at F 5.5 with supersensitive panchromatic film. On a bright cloudy day in summer at the above hours the lens can be set at F 3.5 with regular panchromatic film and at F 4 with supersensitive panchromatic film."

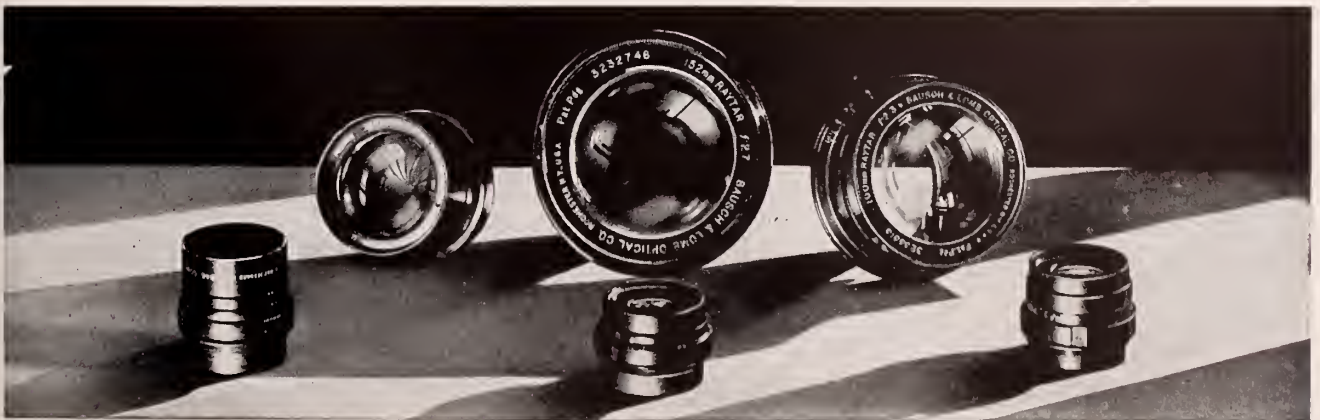
Improvements in Moreno-Snyder Camera

IN the description of the Moreno-Snyder non-intermittent cine camera which recently appeared in THE AMERICAN CINEMATOGRAPHER, it was stated that a purely optical method of forming the frame-line was being developed. This is now said to have been perfected, and is incorporated in all of the cameras now in production. According to Gabriel G. Moreno, the inventor of the camera, and Chief Engineer of the firm which manufactures it, this will completely eliminate the previous device used to form a frame line. "Formerly," says Mr. Moreno, "We used a special pair of moveable flaps in the sunshade, which, though they gave us a frame line of a sort, were not perfect, especially as they had to be set anew for each scene. We have now, however, developed a purely optical method of producing a frame-line (which must be artificially made in all non-intermittent cameras). Our new method has made the camera still easier to operate, and has at the same time given us an opportunity to rearrange certain of the optical units, thereby eliminating certain small aberrations which formerly existed, due to the photographic lenses having been calculated originally for use in conventional cameras. Now that we have had the opportunity to obtain lenses with the special corrections necessitated by our supplementary optical system, our photographic tests have been so successful as to prove that the non-intermittent principle, as embodied in our camera, is both mechanically and commercially sound, and a real advance over the previous types of construction."

Possible Inauguration of Chinese Talking Pictures

REPORTS are now circulating through Shanghai regarding the installation of sound producing equipment in five of the prominent Chinese motion picture studios, according to Commercial Attache Julean Arnold, Shanghai, China. Of this number it would appear that three of the projects are definitely settled while the other two are still nebulous. The equipment to be used in these studios is to be purchased in America and American cameramen and sound technicians are to be brought to Shanghai to teach the Chinese the intricate details involved in the production of satisfactory sound pictures.

Production schedules have not been announced but it is understood that a minimum average of twenty pictures per year is to be the skeleton framework on which future extensions of production are to be built. Although it is expected that the next six months will witness the establishment of the Chinese talking picture industry American distributors maintain that the resulting loss of revenue will be small if any, as the expected increase in theatre sound installations will tend to minimize excessive competitive factors.



A group of the new Raytar lenses, recently placed on the market by Bausch & Lomb. The Mitchell Camera Corp. is the Hollywood distributor.



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Cinematographers

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F/3.5, F/4.5

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Cinematographers throughout the world are using Zeiss Lenses because of the assurance of perfect definition and brilliancy.

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New Portable Projector Put Out By Arc Products

A PORTABLE projector for black and white or natural color, adaptable for sound on film or sound on disc, has been placed on the market by Arc Products Corp., new equipment company, which has just established headquarters in New York. Known as the Vocolor projector, the equipment can be assembled or disassembled in five minutes, and will pack in two compact rectangular containers with a combined total weight of less than 160 pounds, so that one man and a small car can handle it for any distance or purpose, the company states.

Among features claimed for the Vocolor projector are: long range "throw," showing color pictures as large as black and white; complete flexibility, enabling change from color to black and white, or vice versa, at will; normal speed of projection for color, same as black and white; low price of machine.

The apparatus is of simple construction, and the small number of parts means greater ease of operation.

A 16 mm. Vocolor camera and projector also are put out by Arc Products. Vocolor is described as a simple process which takes color pictures on ordinary black and white panchromatic film through rotating color discs in the camera and projects through corresponding discs in the projector.

Movies In The School



The B & H Filmophone presenting a sound film entertainment in the auditorium, Haven High School, Evanston, Ill.

Keasbey & Mattison Co. Markets Sound Screen

A NEW sound screen marketed under the trade name of "Visibestone," consisting of a series of rod-like filaments, the shape and angle being based upon complicated mathematical formulae, has been introduced by the Keasbey & Mattison Co., asbestos manufacturers of Ambler, Pa.

While complete stereoscopic vision is not claimed for this new screen, the rod-like texture of the Visibestone screen is said to lend unusual depth to the projected picture, while the scientifically compounded mesh permits greater and more even sound filtration. It is also pointed out by the manufacturer that the new screen very definitely corrects distortion of both sight and sound. This correction is attributed to the special weaving and rod-like texture of the screen. Light is evenly reflected from the round surfaces of the asbestos threads into the remote angles of the auditorium.

Being basically fireproof, the liability of fire and consequent panic in the theater is greatly reduced, since there is nothing in the Visibestone screen to ignite or smoulder and give off poisonous fumes or noxious gases to alarm the audience, the company declares.

The new screen is being distributed by the National Theater Supply Co.



Decline in Berlin Entertainment Tax Returns

ENTERTAINMENT tax returns in Berlin for the month of June show a further decline of business, according to Trade Commissioner George R. Canty, Paris, in a report to the Department of Commerce.

Total tax receipts for this period amounted to 602,000 marks, as against 670,000 marks for the corresponding month of last year.

It is further stated that forecasts for July made by the officials concerned for tax perception seem to indicate that a record low level will be reached. In July, 1930, receipts amounted to some 529,000 marks, but this year it is feared that they will not be far from one-third of this figure. The important number of entertainment establishments closed in July is a further indication of the present depression.

A Portable 35-mm. Projector

(Continued from Page 15)

the motor through the motor switch and is wired in parallel with the two plugs F. One of these plugs is used to feed the amplifier 110-volt A.V., and the other for an extension lamp or any other device requiring 110-volt A.C. At G is shown the exciter lamp feed receptacle, and at H the receptacle previously mentioned, into which is plugged the A.C. line for feeding the projection lamp. All of these receptacles and the wiring connecting them are mounted in a complete assembly J, and all connections from the lamps and motor are made on a common panel board beneath the bakelite cover K.

Any current-carrying part may be readily removed by disconnecting the wiring at its particular terminal on the panel board, and the entire panel may be removed by disconnecting all of the wires from the various current carrying parts which are connected thereto, and removing the four nuts L.

The projector may be readily tilted to any desired angle by adjusting the tilting nuts. The upper and lower magazines may be easily removed by loosening the screws. The entire equipment, with magazines removed, may be packed in a trunk properly built to receive it, and the entire assembly weighs approximately eighty pounds.

None but the finest materials and highest grade workmanship are employed in the construction of this equipment and the International Projector Corporation feels that it can point with pardonable pride to this achievement.

Western Electric Installations

C. W. BUNN, General Sales Manager of Electrical Research Products, announces the following large list of recent theatre contracts for Western Electric installations:—

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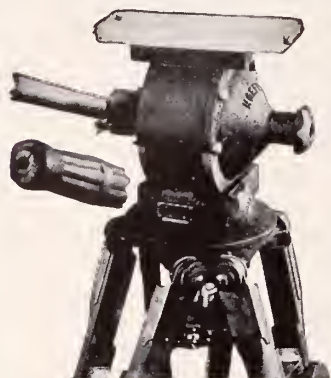
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New Devices at RKO-Pathe

TWO inventions which promise to revolutionize construction methods in the making of motion pictures and which, at the same time, will save the RKO-Pathe studio thousands of dollars annually, have been put into operation at the Culver City studio.

The unique devices, designed and manufactured by David S. Garber, head of the RKO-Pathe studio construction department, are portable spotlight platforms and their installation on the stages of the "lot" has solved a technical problem which for years has bothered the mechanical brains of the industry.

Increased efficiency of fully forty per cent and an actual saving of approximately \$60,000 per year on the studio's operating expenses is, according to Garber, anticipated with the adoption of the new devices.

The problem of motion picture producers in lighting an interior set has always been two-fold: to save electricity, and to salvage as much lumber as possible from the scaffolding and rigging necessary to support the giant batteries of overhead lamps.

In the past, these overhead lamps have been secured on immobile platforms suspended from the rafters of a stage by timbers. Every set required specially built platforms. As a safety measure the lamps were fastened by drilling holes in the platform floor and inserting the bracket-rod of the lamp. This meant that the average life of this same platform was four sets after which it was cut up into tiny bits or used for building fires.

The lives of Garber's device, however, are unlimited because of their portability. Now a part of each stage's standard equipment they are merely rolled up to or slung over a set ready to be moved at a moment's notice.

The first movable platform is one which never leaves the floor. On rollers, it can be pushed alongside of a set by one man, and through wing-nut adjustment, raised or lowered to any desired height. On the top of the upright is the platform floor proper, unique in itself. Instead of the old-fashioned planking through which holes had to be bored, now is found a section of pine ribs twelve feet long and four feet wide. On the bottom side is a heavy netting to prevent tools, nuts, bolts and the like from falling through. At each end of the sections are joints which allows stringing the platforms together to reach any given horizontal distance. Instead of drilling holes in the platform at will in order to sustain the lamps, the holes are permanent, both sides being lined with them at three inch intervals.

The second platform is identical in design as the one described above but instead of being rolled about on uprights it is suspended from the rafters of a stage. Instead of the old-fashioned timbers which rendered the platforms immobile, Garber suspends his by means of chains. Attached to the chain-ends are safety hooks which are placed on the rafters at will and which are instantly removable.

The suspension platform will cope with any given height and this is obtained by block and tackle at both ends of the platform.

Amkino Will Distribute 30 Soviet Productions

OUT of the entire output of motion pictures to be produced this year in Soviet Russia, 30 have been selected for American release by L. I. Monosson, president of the Amkino Corp. The number is eight more than Amkino has handled in past years and is due to the increasing popularity of Russian features of an entirely different make-up than American or other foreign productions, according to Monosson. The films have been selected from the whole production output of 12 motion picture companies in Soviet Russia.

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Moreno-Snyder Camera Makes High Speed For Trick Shot

ONE of the most gruelling tests that a standard camera has ever had to face was encountered by the new Moreno-Snyder non-intermittent camera recently. According to Senor G. G. Moreno, Chief Engineer of the Moreno-Snyder Camera Company, the camera—a standard model, designed for operation at the normal speed of 90 feet per minute—attained higher speeds than have ever been attained by any practical commercial cameras heretofore.

"We were recently surprised," says Senor Moreno, "by receiving a call from the RKO studio, asking us if our camera was capable of speeds of 500 feet per minute or more. Inasmuch as some of our own tests had shown that the camera would operate at nearly double this speed, we replied affirmatively. We were then asked to bring the camera to the studio, where Mr. Knechtel, the head of the Photographic Effects Department, was having difficulty in making some ultra-high-speed shots for some trick work he was doing. When we reached the studio, we found that the subject being photographed was a series of wave-forms in a pool of mercury, which waves were produced by high-frequency electrical vibrators. Mr. Knechtel had used the highest speeds possible with the conventional speed cameras available, but had not been able to slow down the vibrations sufficiently for his purpose.

"We began with our camera running at a speed of 500 feet per minute. This was not enough; so we progressively increased the speed to 600, then to 800, then to 1000 feet per minute. The results were photographically successful, but the speed was still insufficient to produce the desired result. Finally we decided to speed things up to the limit of the resources available. We took two Mitchell overdrive-gearboxes, coupled them in tandem, and drove them with a high-speed motor. The result was that the camera ran at a speed of 1440 feet per minute. This tremendous speed was at last sufficient to give Mr. Knechtel the effect he desired, and he expressed himself as being greatly pleased with the results obtained, saying that they were not only photographically perfect, but, despite the high speed, rock-steady.

"For our own part, we were very gratified at being able to subject our apparatus to such a severe test. It placed a particularly great strain upon the rotary, optical shutter, which revolved at a speed of 3000 revolutions per minute. After having photographed in excess of 6000 feet of film at this tremendous speed, we dis-assembled the camera, and tested the alignment of the lenses in this important unit: despite the terrific strain, not one of them had been displaced so much as 0.001 of an inch.

"Another interesting sidelight is the fact that although we used only f:3.5 lenses, the exposure—even at this tremendous speed of over 400 frames per second—was, thanks to the non-intermittent principle, sufficient so that we could use positive film!"

New X-Ray Camera

A NEW X-ray camera which shuts off automatically when it has just the right exposure for a perfect picture is reported to have been perfected by a European scientist. The camera has an X-ray backstop behind the picture. This backstop catches the rays after they have penetrated the film, and measures them by ionization in a partial vacuum. It is set so that when just enough rays have passed to make the film perfect, the backstop automatically switches off the electric current to the X-ray tube.

The film can be set for any exposure desired. The radiologists said the device is highly valuable for treatment of diseases where success depends upon viewing internal organs with X-ray pictures. Often a slight darkening of otherwise normal shadows tells the story of the disease. There has been some difficulty in distinguishing diseases from mere uncertainties in exposure.

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**Bell & Howell Handling Da-Lite Portable
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THE Bell & Howell Company has announced that it has added to the FILMO line of 16 mm. movie accessories the famous Da-Lite Portable Bead Screen in a variety of models to cover every possible use, and at an entirely reasonable price.

The manufacturers of the Da-Lite Screen have for twenty years specialized in the making of motion picture screens. Da-Lite Screens are to be found to-day in a large majority of the world's finest movie palaces. From this long experience comes the theater efficiency of the portable Da-Lite Bead Screens which the Bell & Howell Company is now offering to the amateur.

The Da-Lite Bead Screen surface is a layer of very small glass beads superimposed on a specially prepared fabric by a Da-Lite process that insures maximum reflection, pliability, and portability. The Lazarus patent No. 1,399,566, issued 12/6/21, covering beaded screens is owned and controlled by the makers of the Da-Lite Screen.

All of the Da-Lite Bead Screen models here announced are either of the folding or rolling type, in which compactness has been achieved with wonderful ingenuity.

Da-Lite Model A Screen

The Da-Lite Model A Folding Bead Screen is contained in a brown leatherette covered wood case, equipped with mechanism which erects the screen semi-automatically in thirty seconds. One motion erects it, and one more returns it to the box. Folding side arms fold into the box when the screen is closed, and a strong spring hinge in the center of the arms snaps them upright as the screen is raised. The jackknife feature of the Model A Screen is fully protected by the manufacturer under Patent No. 1,800,627, granted 4/13/31.

Da-Lite Model B Screen

The Da-Lite Model B map-style Bead Screen rolls up like a window shade into a metal case, which is hung horizontally, with the screen drawn downward for projection.

Da-Lite Challenger Screen

The Da-Lite Challenger Bead Screen is a map-style screen rolling into a metal, tubular case, which comes complete with tripod stand. This screen is equipped with a novel erecting feature which makes it possible to lift the screen into full and positive operating position in one motion. The mechanism holds the screen in perfect alignment so that the screen will not swing on the stand.

Da-Lite Master Screen

The Da-Lite Master Bead Screen is a real achievement in screen design for the use of schools, clubs, churches, institutions, etc. The case into which the screen folds is a steel-bound fiber-case trunk, and the operating mechanism is such that the screen never has to be touched by the hands in raising and lowering. A hand crank operates a worm and gear mechanism, which raises the screen smoothly to its full height quickly and with little exertion. A 9'x12' Da-Lite Master Screen can be erected in half a minute. After the screen is erected, it is then further stretched just enough to remove any "waves", by means of a stretching device attached to the roller—an exclusive Da-Lite feature.

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Babbling About Brittany

(Continued from Page 34)

intimately in her fountain at the base of her statue with formality and precision. I do not know if they must spend the night in pagan prayer but I do know that they bring their swains with them for protection against the dangers of the night. Their prayers are invariably successful.

Now should you feel that you have committed a mortal sin in dallying with pagan gods, you can go a little way down the road to quite another shrine—"Notre Dame de la Roche." Up a short flight of steps from the roadside is a shrine formed of a natural cave, closed in by a arched and grilled gate.

It is a tiny grotto, only a few feet deep, and about eight feet high. Inside a statue of Our Lady above a small altar. **And loads and loads of flowers.** And I do not suppose they are seen by more than one visitor or so a month. Who keeps the shrine supplied with flowers? The little girl who is kneeling in devotion in front of the shrine. She, and her mother and her little sister. But mostly she, herself.

So you may contemplate this lovely grotto shine; you may admire this little girl's spiritual devotion;—but—you will carry away with you the indelible impression made upon you by that amazing, unexpected, flamboyant, brazenly pagan figure, Isis—the Venus of Quinipilly.

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IN the matter of rentals, Motion Picture Producers find it is as important that sources offer a constantly changing selection of furniture and accessories as it is that those pieces be authentic in period type. Thus it is that Barker Bros. Motion Picture Rental Department, in the Wilshire Studio, 3235 Wilshire Boulevard, offers an unique service that is being received with unreserved approval.

Those who make use of this Barker Bros.' service have unrestricted selection from not one but three establishments. Comprehensive collections of the finer modern furniture and accessories for living room, dining room and bedroom, as well as furniture antiques and reproductions, lamps, rugs, rare bronzes, wall hangings and paintings, are shown in the Wilshire Studio, the Los Angeles Store, as well as the Hollywood Store. Selection from these three sources makes it a very simple matter to find exactly the type of piece, or pieces, for particular scenes. Too, such pieces are constantly being sold, constantly replaced with others, so that there is never the inconvenience of having to select furniture and accessories that have grown familiar to the theatre going public. Through this Barker Bros. Rental Service the studios are given unrestricted choice of these tremendous stocks.

A specialization in the modern as well as authentic French and English periods, and in those impressive pieces of unusual photographic qualities, makes Barker Bros. Rental Department of particular importance to the Motion Picture Industry. As comprehensive as the furniture collection is the selection among accessory furnishings that simplify the plan of complete settings.

Barker Bros. also render a most complete service to theatres. Here the stage settings are equally important and call into an augmented service. In the case of the legitimate stage, Barker Bros. will place at the disposal of the producers one of Barker Bros. experts, versed in the technical requirements and with a thorough knowledge of period types, to select the required furniture and accessories for complete scenes.



Talking Films on British Railroad Train

CO-OPERATION between British-Gaumont and the London and North Eastern Railway recently resulted in the showing of a full program of talking films on a train, according to Trade Commissioner George R. Canty, Paris, France.

It is now expected that long-distance trains will in due time have their regular cinemas.

A 60-foot coach on the "Scarborough Flier" was converted in 12 hours for the demonstration, felt and tapestry being used as sound absorbers. A small van coupled to the rear of the coach contained all the necessary equipment for the supply of power. British Acoustic sound set was used. It is stated that in spite of the elaborate precautions there was some difficulty in hearing during the outward journey. On the return, however, the loud speaker was placed in front of the screen, instead of behind, as previously, and it was possible to hear almost every word clearly. Passing trains proved one of the disturbing influences.

The portable set used possesses a fan attachment which blows a continuous blast of cold air into the projector lamp housing so as to reduce risks of fire to a minimum. Moreover, non-flam films were used.

A Gaumont technical expert stated that if the invention proved popular, it would be possible to design a coach that would give perfect results, or to convert an old coach satisfactorily. It would be necessary to line the floor with cork and the coach with a more suitable sound-proofing material than felt.

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Dubray, Jos. A.—Bell & Howell, Hollywood	Koenekamp, H. F.—Warner Bros.	Rosson, Harold—M-G-M.	Walker, Vernon L.—R-K-O.
Dupar, E. B.—Warners' Vitaphone.	Lang, Chas. B.—Paramount.	Schneiderman, Geo.—Fox Movietone.	Warrenton, Gilbert—Universal.
Dupont, Max—Vitacolor.	Lockwood, J. R.—	Schoenbaum, Chas.—James Cruz.	Wenstrom, Harold—
Dyer, Edwin L.—M. P. A. Studios, New Orleans.	Lundin, Walter—Harold Lloyd, Metropolitan.	Scott, Homer A.—	Westerberg, Fred
Dyer, Elmer G.—Caddo.	MacWilliams, Glen—Fox.	Seitz, John F.—Fox	Whitman, Phil H.—
Edeson, Arthur—Fox.	Marsh, Oliver—M-G-M.	Sharp, Henry—United Artists, Doug. Fairbanks.	Wilky, L. Guy—
Fildew, William—	Marta, Jack A.—Fox.	Shearer, Douglas G.—M-G-M.	Wrigley, Dewey—Pathe.
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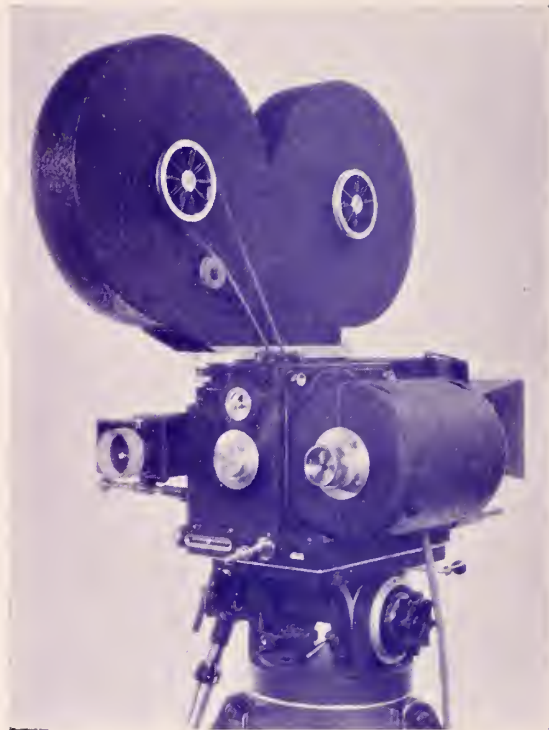
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October 1931

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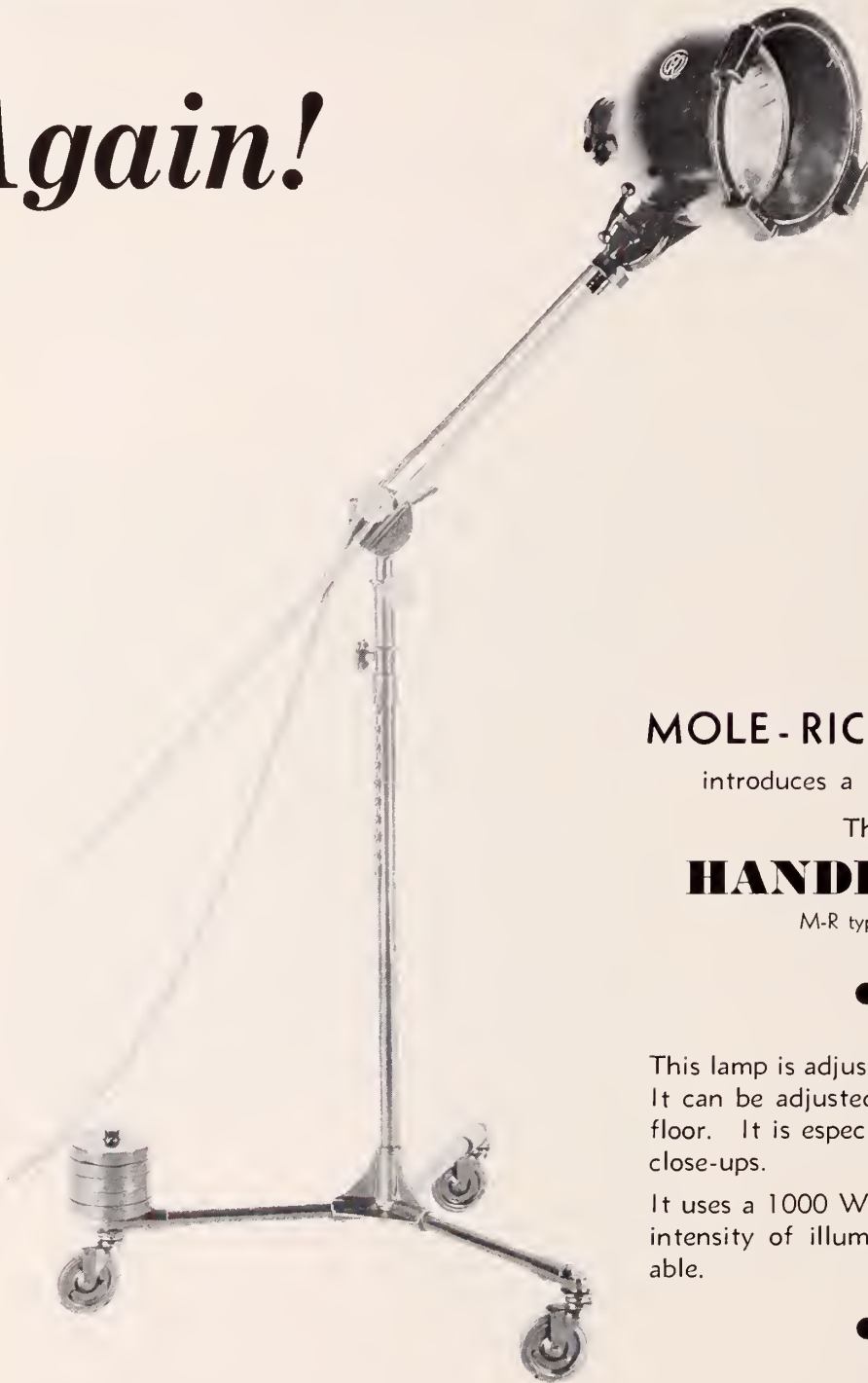
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Volume XII

OCTOBER, 1931

Number 6

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Cover, photograph by Russell Ball

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- This contest is open **ONLY** to **AMATEURS**. No professional cinematographer will be eligible to compete. It is a contest solely for the amateur, either the individual or the club.

- The contest officially opens November 1, 1931. The contest ends at midnight of October 31, 1932. All pictures must be entered by the closing date or they will not be considered. Entries mailed or expressed bearing the date of sending will be accepted if they reach THE AMERICAN CINEMATOGRAPHER office after October 31, 1932, providing the date shows they were sent before midnight of October 31, 1932.
- Pictures submitted in this contest will be judged upon photography, composition, direction, acting, cutting and entertainment value. And only silent pictures will be eligible for the contest. The judges, whose names will be announced later, will include outstanding and widely known Cameramen, Directors, Actors, Writers and a group of nationally known Motion Picture critics from some of the best known newspapers in America.
- The decision of the judges will be absolutely final, and there can be no appeal from their decision. Announcement of the awards will be made as soon after the close of the contest as possible and checks will be mailed the winners.
- Pictures may be submitted either by individual amateur movie makers, or they may be submitted by Amateur Movie Clubs. However, they MUST BE photographed on 16 millimeter or 9 millimeter film. Accompanying each entry must be a sworn statement to the effect that no professional cinematographer assisted in the making of the picture. No pictures will be accepted which were photographed on 35 millimeter film and then reduced to 16 millimeter.
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CAMERA!

By LLEWELLYN MILLER

Reprinted from the Los Angeles Record of September 19, 1931

“CAMERA,” calls the director, and a man beyond the range of the brilliant lights holds himself ready. That man behind the black box, which is the very life of moving pictures, is an obscure personality, except to a small circle within the industry itself. His name does not make electric lights on any theatre. Many times he does not receive acknowledgment, even in small type, on the credit lists. He is just the cameraman . . . necessary but somehow unnoticed.

There is a reason.

All too frequently in these days, when the motion picture is still discovering that it can be an art, photographing a picture is just a routine job. All too frequently flat lighting, a static camera, and unrelentingly monotonous angles have made the camera job not worthy of any particular notice.

We have become used to expertly made pictures. The public has reached the point now where they need something more than a competent mechanical job to keep them interested.

Then, once in a while, along comes a film which shows the brilliant effect of one man's ingenuity. Immediate interest follows.

THIS CAMERA, this small machine of cogs and wheels, and strips of film, is a challenge to the talented, and a defiance to the dumb. Lights and shadows . . . moving lines and masses . . . those are the cameraman's tools. With them he can make an ordinary picture distinguished, give a poor plot a certain feeling of significance, and make or break a mood in an audience.

DIRECTORS of the future are going to have to be competent behind a camera as well as able to control actors in a pattern of drama. It is just as absurd to expect a painter to employ another man to mix his colors, as to expect a director to rely upon a cameraman to compose his effects for him.

Only once in a long while is such a combination successful. It happened in “The Spider.”

Some day, the camera is going to come into its own, and be recognized as the most important tool in making a picture that moves.

That will be the day when the flagging interest of the public will be intrigued again in the product of film studios.

That will be the day when pictures can rival the stage on the basis of aesthetic achievement.

That will be the day when something of real value will happen every time a director calls,

“Camera!”

Undersea Photography with an Eyemo

by **ALFRED L. GILKS, A.S.C.**

Chief Cinematographer, Vanderbilt Oceanographic Expedition

ACTUAL moving pictures of marine life and conditions can form a very valuable adjunct to the more conventional data collected on an oceanographic expedition. Unfortunately, however, the making of such films usually entails the use of diving bells, or Williamson tubes, the bulk and cost of which generally more than offset the value of such cinematographic records, particularly since the utility of such bulky apparatus is rather limited. Within the last few years, however, a device has been perfected which brings undersea cinematography to the point of real practicability. This device is what might be termed a diving suit for an Eyemo camera, and it brings to the underwater cinematographer all of the many practical advantages of the hand cine camera, and at the same time widens his scope considerably, as he may work freely in a diving suit, going after his subjects, rather than waiting for them to come to him.

The origin and development of this case—one of which I am fortunate enough to have with me on this present expedition—is due to Mr. E. R. F. Johnson, of Camden, N. J. Always interested in photography, Mr. Johnson was first attracted to undersea work while spending the winter of 1928-29 in the West Indies. His first case was a crude sheet metal affair in which he placed an Eyemo camera. The results, he tells me, were "mostly experience!" They must have been useful, however, because they enabled him to design and build a better outfit. A trial of this showed the need of further improvements and conveniences, so a third model was made.

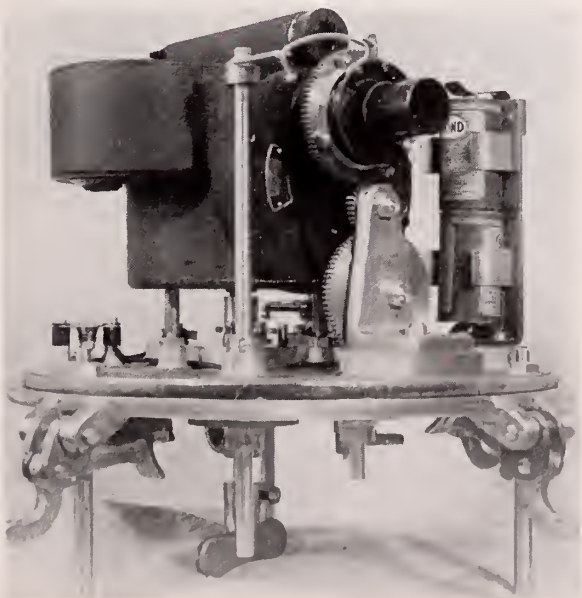
The first model was merely a water-tight box to protect the camera, and with an arrangement for operating the trigger-release from the outside. Within its limitations, it worked well enough, but unfortunately it required the removal of the camera from the box for winding, focusing, and adjustment of

stops, as well, of course, as reloading. This necessitated coming to the surface of the water far too frequently to be practical, as each trip meant at least a loss of valuable time and daylight—and frequently the loss of many good subjects, as well. Therefore on the second model, a means of winding the camera under water was added.

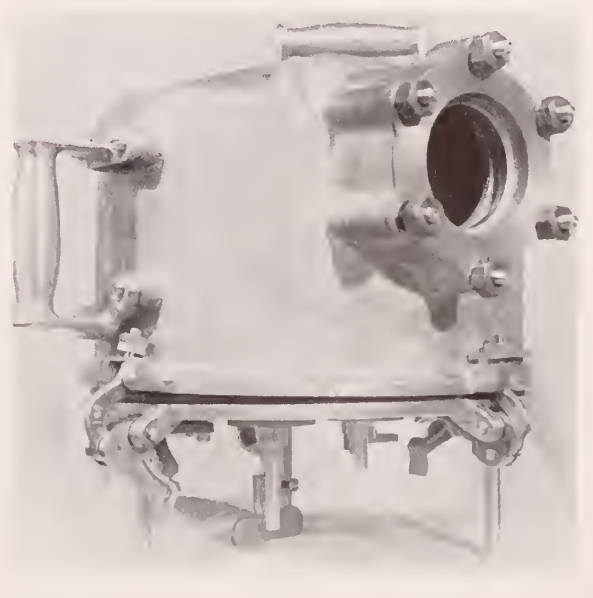
The design of the third model was attacked with the thought that the undersea photographer, being confronted with an entirely new group of problems of light and focusing, to say nothing of the obvious difficulties of working in a diving outfit, should therefore be given all possible conveniences, so that his under water work should approximate as nearly as possible the convenience of open air operation.

The result was particularly pleasing, for with the final model means are provided for focusing, timing, winding, trigger release, sighting, leveling, and footage reading; everything, in fact, but reloading, which must, naturally, be done at the surface. And the camera may be operated under water with the same facility that an uncased Eyemo is used in the open air.

The case is made of two parts: a base which carries the camera and all the operating mechanism, and a cover or hood resting on a gasket in the base, and held water-tight by four easily operated clamps. Reloading is simplicity itself: the clamps are released and the cover is lifted off the base, exposing the camera with the film chamber uppermost, where it can be reloaded in the usual way. Once reloaded, it takes but a few seconds more to replace the cover and lock the clamps, after which the camera can again be lowered to the diver. Since the camera is entirely supported on the base, and operated therefrom, it is unnecessary to disturb any of the operating connections—a very important advantage in undersea work, where the element of time may be of great importance.



Here is how the Eyemo fits into the underwater housing.



The underwater camera housing used by Mr. Gilks for his Eyemo.

The cover is provided with ports for sighting and exposure, and with convenient handles for manipulating the outfit by hand, as well as a socket for tripod mounting.

The approximate overall dimensions of the outfit are 12" x 14" x 16". The weight, in air, loaded, is about 40 lbs. This may seem rather great for a hand-camera, but the displacement makes the effective weight in water much less—practically the same as that of the camera alone in the air, so that it is very easily handled in action.

A troublesome feature of undersea photography, especially in humid climates, is the fogging of the glass exposure port by condensation when the camera is lowered from warm moist air into the cooler water. This has been overcome by providing an air dryer in the form of a container filled with calcium chloride, through which air is forced into the closed camera case. In our preliminary tests, air at 90 degrees and 80% humidity was so thoroughly dried that there was no precipitation when the case was plunged into water at 40 degrees.

Undersea photography presents quite distinct problems in the way of distance, visibility and light intensity. The light is, of course, far less intense, and the clearness of the water directly affects not only this but also visibility. Furthermore, refraction in water is very deceptive, and has a magnifying effect, making apparent distances much less than actual distances. To counteract this, the focusing dial must be specially calibrated for underwater work. The usually accepted index of refraction is 1.3, which we found to give a very satisfactory approximation for preliminary markings, which, of course, were finally corrected under actual underwater operating conditions. The curves secured in calibrating the two lenses that I am using in my outfit—24mm. and 47mm. Cooke "Speed Panchro" lenses—are shown. The curves for air were obtained by clamping a scale to the focusing knob and reading off on this scale the positions of the various focus markings as originally on the lens. The scale was divided into sixty equal parts reading from 0 to 60 as the focal distances advanced from infinity to the minimum possible for the particular lens being calibrated. Then the lens marks were indexed by the line on the camera and read off this equally divided scale in terms of sixtieths of a rotation.

The points thus obtained determined the ordinates of the curve, and using the corresponding distances, the curve was produced.

Various points on the abscissae were taken, and starting from the curve for air, photographs were taken at every other division of the sixty-unit scale. Five or six exposures were taken in this manner for every distance necessary to determine the scale.

The film was then developed and examined for focus. The various exposures were numbered according to the divisions of the outside scale, and the one in focus was plotted on the curve at its corresponding number.

When completed, these points made up the curve for focus under water. Using the same scale, and picking even feet off the curve, and marking these points on this scale resulted in the final scale on the underwater focus dial. Since the camera I am using is one of the turret models, equipped with two lenses, the dial carries two sets of figures, with a moveable cover so that only the desired set of markings can be read.

It is interesting to note that the actual curve for underwater work follows the index figure very closely except at short distances. This is probably due to the greater percentage of air and glass distances in the total distance from the lens to the object at these shorter distances. There may, however, be other factors. In any case, we only used the index curve as a guide for actual calibration.

But by no means all of our photographic work on this expedition will be done underwater. Our itinerary is of such a nature that we will find an abundance of photographic material of a geographic and ethnological nature. From New York (or, to be exact, Northport, L. I.), we have thus far travelled down the Atlantic coast to Florida, then to Cuba, Jamaica, and the Canal Zone. From here our route will be to Cocos Island, then to Galapagos, and then across the Pacific to the Marquesas group. From there we will go to the Taumotu Archipelago, then to the Society Islands, the Cook Group, Tonga, Fiji, New Hebrides, New Caledonia, and to civilization again at Brisbane, Australia. From there we will go along the Great Barrier reef on the northeast coast of Australia. Then to the south coast of New Guinea, then to the Timor Islands, Flores Islands, Java, Sumatra, Malaya, Siam, India, Ceylon, Arabia, then through "the Ditch" and into the Mediterranean. All told, it will take us about six months, and will mean travelling approximately 30,000 miles—mostly quite away from civilization and any base of supplies. Fortunately the Vanderbilt Yacht "Alva," upon which we are



Mr. Alfred L. Gilks, A. S. C.

travelling, is relatively large, and very completely equipped. The scientific equipment seems complete enough to be able to take care of anything from an amoeba to a whale. Our photographic equipment is hardly behind it: in addition to our submarine Eyemo (which we will occasionally press into service above, as well), we have a Filmo, a standard Bell & Howell, and a Mitchell. Both of the standard cameras are equipped to handle multicolor as well as black-and-white. Naturally, we are carrying an almost unbelievable amount of film for these cameras. In addition, we have an 8x10 still camera and a variety of Graflexes of different sizes. We have a small, but complete darkroom, and adjoining it a special room for the storage of our photographic supplies and apparatus.

Silent Movies Come Back

by **PROF. J. TARBOTTON ARMSTRONG**

Curator of Motion Picture Museum, University of Southern California

I AM DEAF, but I go to the movies. I cannot hear a word, although I can hear most of the music. But I find that, in many instances, I get more out of them than those who go with me. The reason is that, since I can not hear, the pictures are practically the silent pictures of old. I also find that I enjoy the talking pictures I can not hear, more than I enjoyed the old silent pictures.

In trying to make talking pictures, the producing companies are getting better silent ones, and for this reason I now patronize the movies more than I ever did the silent ones.

I would suggest an experiment—partitioning a portion of a large theatre by glass or some other medium, so that while the picture might be seen, no sound except that of music could enter. Then the producers might study the effects of the silent and talking versions of the same picture upon audiences, and also give some explanation of the present non-attendance of motion picture theatres. The experiment would be certainly worth while. A little explanation would be necessary for the silent version, but this could easily be added. Also, those talkies which have proven failures, might be, with little alteration, reproduced and shown as silents, and should at least make the cost of production.

I feel certain that pre-views I have seen of some productions, that have never been shown to the public, may become good payers if they were shown as silent pictures.

Reference up to the present has been of feature pictures only. But in short subjects the talking portions might in many cases be also eliminated.

In African pictures, for instance, the dialogue is superfluous, although the screen announcement of what the picture represented should be added.

Besides, these screen announcements are beneficial in giving an educational viewpoint on the manners and customs of other countries, which is appreciated by the bulk of the movie fans, and will always be wanted, but is being spoiled by the addition of the talkies, the reason they are tolerated is because they are an excellent medium for imparting knowledge of the inhabitants and customs of the different countries that are not well known, and this will always be liked.

To look at the question from a scientific viewpoint. Why should one who is deaf enjoy the unheard talking pictures more than the silent pictures? Because with the invention of better apparatus the operator has become more able to catch and reproduce movements. As someone has only too truly said "The operator will have obeyed the second law of cinematography when he understands the rhythm of a film, like musical rhythm, consists in an harmonious sequence of pictures, taken from different distances and angles." The directors do not realize it, but they are giving us more "Art," this connected with admirable lighting, and better photographic work than ever, giving splendid entertainment to a deaf movie fan.

I believe that if one of these good operators were to make one of the silent pictures, with the use of his present day apparatus, he might produce a picture that would be acceptable to today's movie fan, because he has increased his film-sense and developed his cinematographic art far beyond that of

the days of the silents. The picture will appeal more if in color.

With the addition of color the type of film I am mentioning would certainly outrank the old form of silent motion picture, and possibly lead to the general adoption of this method of producing pictures. If the picture were a good one, little explaining would be needed.

The makers of cinema pictures have in their hands the best means of giving to audiences rest and recreation, which is wanted more and more in this machine-made thinking age.

We are looking forward to these ideas and some other additions becoming the real discovery of cinematographic art.

The talking pictures have brought about many developments in the art of making motion pictures—but became so popular that the old silent pictures were immediately abandoned. While the talking pictures were a novelty, nobody believed that the silent pictures could ever return, and all experiments along the line of improving silent pictures were given up. But the talking and the silent picture are two different mediums of entertainment. Some people prefer to look, others to listen. Some are out to catch every word of flashy dialogue, while others wish to have their concentration upon the movements of the characters, uninterrupted by words which must be heard.

The motion picture offers far greater opportunities of expression by pantomime than does the stage. Another point to be considered is that failure to make acceptable foreign versions will eventually cost great losses in foreign countries for American motion pictures.

Experiments often require a great deal of pains and work, but they are necessary. The talking pictures are losing their hold upon a large portion of their audiences, as shown by recent poor attendance at motion picture theatres. This is a dangerous situation, and a remedy, even if an expensive one, must be found. But the talking picture need not drive either the silent picture or the legitimate stage from existence. They are separate mediums of entertainment, and all will have their following.

There are many who go to the motion pictures for rest and recreation. The silent pictures, generally with organ or orchestra selections added, provided just this. The talking picture can not, since it requires that both eye and ear be constantly on the alert (especially in houses where acoustics are not what they might be).

But if the unheard talking picture can provide better entertainment to one who is deaf than did the old silent picture, this is proof enough of the possibilities of the silent picture, improved as it is by recent inventions. It may well rise to art standards and entertainment values previously not dreamed of.

The screen will always be more visual than aural.



Professor Armstrong, recognized as an authority on the historical phase of motion pictures, will contribute another article in the near future dealing with some early aspects of motion pictures.—Ed.

Screen Definition

by **DR. L. M. DIETERICH**

Consulting Engineer

Part XI

THE SECOND group of individual improvements enhancing depth effect can be subdivided into two classes. The first class comprises special projection methods and the second relates to specific screen designs.

Both of these classes as herein considered relate only to the reactions upon normal binocular human vision without any special viewing devices.

The first class relates fundamentally to endeavors to imitate parallaxic screen effects by the simultaneous or alternating projection upon the screen of either stereoscopic couples or relatively displaced identical photographs.

As previously shown it has so far been impossible to project stereoscopic couples of appreciable parallaxic characteristics with satisfactory screen registration by either simultaneous or alternating projection.

The results have, to the knowledge of the author, always consisted in either a blurred or partly double images.

If, however, the parallax in taking stereoscopic couples is reduced to such a minimum that their coordinated projection shows non-registration within or closely approaching grain limitations, then only a comparatively small increase of depth effect over that of a standard picture is obtained.

This, in itself, is not of sufficient value to warrant its use, but does become valuable when combined with, in themselves again, only small effects produced by other methods.

The very same conditions exist for the method of the slight displacement of alternating normal photographs.

This method has frequently been tried by vibrating the projector or its optical axis in either linear or circular motion.

A third method consists of slight periodical changes of the focal value of the projection lens system and a fourth method of introducing by lens manipulation small distortion values either permanently or periodically, especially in a horizontal direction.

All of these methods produce, as pointed out in reference to method one, only unimportant results when limited to acceptable screen definition, but result in rather pleasing effects when properly combined.

Such improved projection effects are comparable to those obtained in normal photography, when a camera records distance shots while on a moving support as often observed in aerial photography or when the camera is on board a moving train or boat.

The reason for in this case often startling depth effects lies in the fact that the focus for any given object in the field changes continuously while its image size varies only imperceptibly for adjacent frames.

A judicious use of previously mentioned methods opens in their proper combination the practical possibility of obtaining similar effects by projection methods only.

The second class comprises a great number of special screen designs of which only a few can be mentioned here. These endeavors relate either to characteristic surface treatments of the flat screen, in the predetermined curvature of the screen surface or in the introduction of auxiliary screen surfaces.

As far as interesting improvements in the flat screen field are concerned the so-called Translux screen might here be mentioned which apparently takes advantage of the fact that a transparency always looks more pleasing than a paper print.

This characteristic increase of depth effect by viewing a picture illuminated by transmitted rather than reflected light is well known and has for years been used by rapid sketch artists exhibiting their skill—always on a transparent surface.

The impressive results of their art immediately lose all their charm and depth effect when lighted from the front.

The so-called beaded screen is another interesting result of flat screen improvements. If the crystal beads imbedded in a white cement are of sufficient size the right and left eye of the spectator see two dissimilar pictures producing a pronounced depth effect. Such so effective bead size, however, destroys acceptable screen definition and we have again the condition that in order to maintain such definition the lenticular beads must be and are in practice of such small size that the dissimilarity of binocular impressions is of such a small degree that the increased depth effect, although existing, is hardly perceptible as such but does increase the general pictorial qualities. The manufacturers have recognized these characteristics by advertising such screen of "brilliance and depth, producing almost a stereoscopic effect."

Vertical screen ruffles of lenticular or prismatic cross-section produce similarly restricted depth effects.

Screen perforations or other means of discontinuity of the reflecting screen surface, now frequently used for sound effects or transmission, have similar restricted depth effects, comparable to half-tone prints of photographs.

If such visible screen surface interruptions are produced by the superimposition upon the screen of non-continuous and in themselves also reflecting surfaces, we enter into the class of auxiliary screens.

One of the simplest forms known to the author was the covering of a standard screen by a silvered wire mesh screen which combined the effect due to interrupted screen surface with the introduction of two instead of one screen surface. The distance between the two interrupted surfaces and the corresponding blocking of details on the main screen by the auxiliary screen controls the dissimilarity of the pictures as seen by the two eyes and thereby the general depth effect. Here again the distance must be kept very small with a resulting very small increase of depth effect as otherwise a doubling up of details appears.

Similar results were produced by covering a screen with an irregular running sheet of water.

A triangular full screen fastened with one corner in the center of the regular screen, rotating at high speed and about $\frac{1}{2}$ " apart from the stationary screen, produced very good depth effect for central vision but double images for side view.

These and a number of similar endeavors to use auxiliary screens at different locations from the main screen again show that whenever appreciable improvements in depth effects are obtained, they are marred by double image distortions and whenever such distortions are reduced to an acceptable minimum, that then the depth effect improvements are not of an independent value to warrant the employ of any one of these methods by itself.

The third group comprises the attempts to produce increased depth effects by curvature of the screen exemplified by the construction of a screen by Dr. Pech some years ago approximating in its curvature (semi-hyperboloid) the focal surface of the projection lens.

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Pathe Studio Uses New Photophone Portable Recorder

by **WILLIAM STULL, A.S.C.**

WHEN studio recording engineers speak of a portable recorder, they generally have reference to the type which gains its portability by being mounted in a five-ton truck—which it completely fills. The truly portable units, which have achieved a degree of compactness comparable with that of the camera, although they have done yeoman service in the newsreel and commercial fields, have seldom, if ever, been used to record important sequences in the productions of a major studio. This is due to two principal reasons: in the first place, few—if any—units of a major studio have had to work in locations where the existing truck-borne type of recorder could not be used; in the second place, no such feather-weight apparatus has been produced by either of the major sound equipment firms, to which the studios are under contract as to recording equipment.

During the making of "Suicide Fleet," a recent RKO-Pathe picture, however, the company was forced to work under conditions where such equipment could not have been used. Fortunately, at almost the same time, the RCA-Photophone engineers had perfected a truly portable recording unit for use with their system, and one of these units was employed in recording much of the picture.

The new outfit is remarkable, not alone for its unusual portability and compactness, but also for being the first of its kind to use the variable area type of record, rather than the variable density type more commonly encountered. It is, of course, of the double-film system, using separate films for sound-track and picture in accordance with studio practice. The recording head is in appearance very like an ordinary camera, and, like a camera, is mounted on a baby tripod. The actual recording unit is practically identical with the standard Photophone studio unit, except that the galvanometer is rubber-damped rather than oil-damped. This unit has proven itself sufficiently robust to withstand all of the rough handling inevitably incident to location work. Although the present unit does not include the biased track method of ground-noise elimination, it can readily be fitted therewith. Being designed primarily for newsreel use, this noiseless recording feature was deemed unnecessary, although such subsequent units as may be provided for studio use will probably incorporate it.

The amplifier is a special three-stage one developed in the Hollywood laboratory of RCA Photophone Inc., under the direction of Harry Jones and Ralph Townsend. It is equipped to handle two microphones.

The power supply may be from batteries or from a small generator set such as a Kohler home-lighting plant, which is satisfactorily small and portable for use by studio units.

The complete outfit, except for its power supply, weighs approximately two hundred pounds, and packs into nine small cases, similar to ordinary camera-cases.

The quality of the record is unusually high for a portable recorder. In many respects it equals that of the larger studio units, although its lighter construction naturally precludes the use of so heavy a vibration-damper as the studio recorder is driven through. For dialog and sound-effects, however, it is perfectly satisfactory, while those who attended the Spring Convention of the Society of Motion Picture Engineers in Hollywood will no doubt remember the excellence of the recording made with it in the Mormon Tabernacle at Salt Lake City, by the Mormon Tabernacle Choir.

According to Don Cutler, the recordist on "Suicide Fleet", the picture could hardly have been made but for this new recorder.

"Although we carried one of the regular studio units, which, you know, is mounted on a small hand-truck," he says, "the nature of our locations would have prohibited its use—if we were to turn out the picture on anything like an efficient schedule. For two weeks we were working at sea on destroy-



The Recorder in use.

ers, submarines, and sailing-ships. We simply couldn't have shifted the big unit around under these circumstances. I believe that if we hadn't had the new portable, we'd still be shoving that big unit around the boats, instead of being through with the picture, as we are.

"Besides, there's very little room to work in on a destroyer—and still less on a submarine. We might manage to find room for the big recorder on one of the destroyers; but where we could have stowed it in the sub, I don't know. The little unit, on the other hand, could be used anywhere that there was room to set up a camera.

"The matter of power-supply was relatively simple. While we were working on either of the two clipper-ships that we used, we had plenty of room to use the Kohler generator, which we could locate far enough away from the mikes so that its purr didn't pick up. When we were working on the destroyers or the subs, we merely hooked our generator into the ship's power lines.

"The quality of the recording we could get with the baby outfit surprised all of us. On the rare occasions when recording conditions were ideal, the quality was practically as good as though we had been working on the home lot. When things weren't so ideal, the quality was still surprisingly good. Some of our scenes were made while the destroyer was ploughing through rough seas at twenty-five or thirty knots. Other

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Many Innovations in New M-G-M Laboratory

by WILLIAM STULL, A.S.C.

A FILMLESS film laboratory! This is the paradoxical impression given by the new film processing plant recently completed by the Metro-Goldwyn-Mayer Studio. For despite the fact that this new plant turns out more than 350,000 feet of film every eight hours, there is never more film in evidence than the comparatively small amount actually being worked upon. From the moment that the film enters the building until the time that it leaves it, it is always kept in fireproof containers except at such times as it may be actually undergoing the processes of development, printing, or assembly. In theory, these precautions may represent nothing new, but in practice they do, for the equipment and routine of the plant have been so devised that these precautions can be exercised at all times without inconvenience or delay.

To technician or layman alike, this new plant is a revelation in its efficient design and operation. To the technician—and particularly to the cinematographer—perhaps the outstanding feature is the fact that it permits both individual treatment of negative development (by a remarkably flexible battery of developing machines) and an unusually high capacity. Its maximum capacity is in excess of 4,000,000 feet of positive and 300,000 feet of negative per week. To the factory-planner, undoubtedly the outstanding features are the amazingly efficient layout and routing of operations devised by its head, John M. Nickolaus, together with the careful planning which allows for an expansion of nearly 50% of its present capacity in case of need, or new developments.

All film enters and leaves the building through a single receiving and shipping room. From this point it is routed in a straight line through the various departments, to return to the shipping room as finished release prints ready to be forwarded to the exchanges throughout the world.

Directly by this receiving room is the loading room, where the film is placed in the camera magazines, and when exposed, removed therefrom, and passed to the adjoining negative developing room. There are four negative developing machines, all of M-G-M-Simplex design. **Each of these machines is a separate unit, and completely independent of all the others.** From the mixing tank in the chemical room above to the air-supply used for drying the film, each machine is an independent unit. This naturally permits a great deal of freedom in the processing of the negative, allowing Mr. Nickolaus to get the best possible results no matter under what conditions the cinematographer may have been forced to work. No operation in one of these machines in any way depends on any of the others. The developer for each machine is mixed in its own mixing-tank which is directly connected to a circulating tank, which it feeds by gravity. The circulating tank is directly connected to its developing machine. The developer is circulated at the rate of fifteen gallons per minute; pumped into the bottom of the tank and overflowing at the top of the tank back into the circulating tank. The temperature of the developer is thermostatically controlled, with a double check through independent thermometers in the lower circulating-tank room and above in the developing-machine room; both thermometers take their readings from the same point—the circulating-tank. The temperature of the developer, through this automatic control, is not allowed to vary more than one quarter of a degree. Such precision of control, by the way, was unknown before the development of these new machines, and had been declared im-

possible by thermostatic engineers. The hypo is also on a circulating system, the silver being removed electrically, and the solution kept always at the proper strength and temperature. The hypo-mixing room, incidentally, is entirely separate from the developer-mixing rooms, ensuring absolute purity of solutions, uncontaminated by even the fumes of each other. The air feeding each machine is also a separate unit, making it possible to operate each machine quite separately as to solution, timing, and temperature.

From the negative-developing room, the negative is taken, in either the familiar fire-resisting cans or in fireproof hand-trucks to the printing-room above. From here the exposed positive is carried across the corridor to the positive-developing-machine room. This is practically a duplicate of the negative-developing-machine room, save that it houses a battery of eight developing-machines, making a total of twelve developing-machines for the plant. These machines are entirely separate units, each one being totally independent of the other eleven, therefore it is possible to operate these twelve machines with twelve different formulae, twelve different temperatures, and twelve different developing-speeds. It makes no difference to the plant whether one or all twelve machines are operating at the same time.

For the final stages of assembly, inspection, and polishing, the prints are returned to the lower floor, and travel in a straight line through these departments to the shipping room, where they are boxed and shipped to the exchanges. During all its transit between these departments, the film is kept either in cans or in the closed, steel hand-trucks. When in these departments, either before or after the work of that department has been performed, the film is kept in fireproof steel lockers, equipped with self-closing doors. Due to these precautions, the fire-hazard is reduced to the absolute minimum. According to Mr. Nickolaus, there is less than one-tenth as much film exposed at any one time in this plant than there is in many older laboratories of vastly smaller capacity.

Another novel feature of the plant is the lighting system. The building has been designed expressly with a view toward simplification of every possible detail. Therefore the lighting system has been so planned that there are no light-traps to be traversed in going from one department to the other. Instead, as you travel from one room to the other and along the corridors, you will observe that the illumination graduates from daylight to red, yellow, or green, according to the requirements of the particular type of film being handled at that point. It is therefore possible, for instance, to carry the rolls of exposed positive directly from the printing room to the positive developing room directly across the corridor, without the delays ordinarily caused by wrapping, or by traversing light-proof doorways.

The water supply from which the solutions are made up is from the laboratory's own water-conditioning plant, in which the water is softened and filtered, and then heated or cooled to the proper temperatures; both hot water, ice water, and water at normal temperature are available.

The ventilating and air-conditioning system is likewise worthy of mention. Too often in such plants the air in all

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Some Thoughts on Low-Key Lighting

by CHARLES LANG, A. S. C.

THE INTRODUCTION of Fast Film brought with it great benefits to all types of cameramen, and with it too, new problems to be surmounted. I doubt, however, if any class of cameramen received quite so many of either as have those of us who, either from preference or necessity, work with a low key of lighting. Here was a new film which can inherently make our work much simpler, but which also makes us adopt a new technique if we wish to utilize its greatest benefits.

In the first place, Fast Film allows us to use less light. In the second place, it is naturally inclined to yield soft gradations; I doubt if it is possible to get a really over-contrasty picture with it. But—and there's the rub—this very tendency to soft gradation which is a great advantage to the normal worker, can be the undoing of the unwary low-key worker. The reason for this is that whereas the normal worker, sometimes intentionally, sometimes unintentionally, almost invariably lights his set for quite a high degree of brilliance, the low-key worker, on the other hand, habitually works with extremely soft lightings, which, when coupled with the naturally soft characteristic of the new film, is very likely to become over-soft, and flat.

Therefore, while the normal worker can adapt his technique practically unchanged to the requirements of Fast Film—and even derive an appreciable degree of benefit from its inevitable softening effect, the extreme low-key worker must devise a new technique by which to combine the soft, low-key lightings which he desires and the softness inherent to Fast Film. In other words, the man who works in a medium or even a high key of lighting can light his set in the manner he is accustomed to, and then, with scarcely any change other than replacing the globes in his lighting units with others of lower wattage, be ready to use the new film with confidence—and in fact, get even better results than before. The low-key worker, on the contrary, can seldom do this, for if he does, he will find his work becoming gray and flat. Therefore, he must discover a new technique of lighting which will give him the effects he desires without the exaggerated softness which he does not desire.

It is easy enough to say this—but it is quite another thing to do it. For although we may proudly proclaim that lighting is an art, and is not therefore something to be done after a set fashion—by rote, as it were—most of us have a lamentable tendency to classify the situations most frequently met with, and then to always meet them in the same way. In a situation where one's whole lighting technique can be modified uniformly—as in the case of workers who habitually use a higher key of light—this is not entirely a disadvantage; but in our particular instance, where the only remedy is altering the technique specifically to fit the individual occasion, it is far from helpful.

Here is our problem: we habitually work with a soft, low-key lighting; we are given a new sensitive material which has an inherent tendency to softness, and which will, if we merely lower the overall intensity of our illumination, exaggerate that softness into flatness. How then are we going to utilize the economic and artistic advantages of this new film, and at the same time retain the soft but brilliant results which we desire?

The first step, naturally, is to take stock of what we have already at hand. The new film can be a considerable aid, for to offset its tendency to softness, it has several advantageous characteristics. First among these is its excellent color-separation. This represents a considerable improvement over the earlier emulsion. Second is its surprising faculty of penetrating shadows. Both of these can be turned to our advantage.

If we can contrive to see to it that our sets are not monochromatic—that there is a pleasing visual color-contrast in them—the superior color-rendition of the new emulsion, which closely approximates that of our eyes, will help us to get depth and brilliance into our sets. The surprising sensitivity of the new film, as shown by the way it reaches into the shadows, will also help us, inasmuch as it will allow us to concentrate more on the highlights, knowing that if some light strays into the shadows, there will be just about the degree of soft detail that we want to have in them.

So far, so good; but we have not considered our people. And our main object is to make them stand out properly. Well, having our set taken care of, we can concentrate on the actors. To my mind, the best method is to light them in quite a higher key, and rather more contrastily than usual. This, combined with the characteristics of the film—its soft gradation, its unusual shadow-detail, and its superior color-rendition—should give us what we want: a soft, low-key picture, yet with plenty of brilliance to point the action. Even if we somewhat exaggerate the contrast of the lighting on the players, the softness of the film will likely tone it down to very nearly what we want.

Of course, each cinematographer uses his individual lights differently, but personally I have found that the "Lupe" is invaluable in lighting people in scenes where there are but two or three players, and making them stand out more brilliantly in scenes of an overall low key. A particular advantage of this lamp is the fact that it is mounted on a stand which must be a cousin to the microphone boom, for it permits you to place your Lupe well in the center of your picture, and fairly high up, at quite the most advantageous angle to play a fairly concentrated, yet softened, front light on the faces and forms of your players—and at the same time leaves the camera a clear field below. Such a light, so placed, will, in conjunction with a moderate amount of general front and modelling light (the former of low wattage, and well diffused), do a great deal toward giving the exact effect of low-key brilliance that we want.

While speaking of photography, I cannot let this opportunity go by without putting in a good word for the campaign which the A.S.C., under the direction of President Arnold, has instituted with regard to improving the quality of release prints. Leaving aside the economic questions which are naturally of even greater importance to the industry as a whole, the artistic and professional sides to the question are of great importance to the cameraman.

After all, it is by the release-print that our work stands or falls. For while the cameraman does not as a rule secure a great deal of personal recognition from the people outside the industry—who are the principle ones who see the release prints—it is his business to give to them the best representation of the stars and story that is within his power. In other words, the best photography. If the photography in the final product—the release print that is sold to the public—does not exhibit the cast and story of the picture as perfectly as is possible, the work of all the other artists on the picture (to say nothing of that of the cameraman) is wasted, in exactly the proportion that the release print falls below its potential best. Every moment of the cinematographer's working day is spent in striving to get the best possible picture on the negative. The master print used in the studio is of course the criterion by which he is judged by his immediate associates and by his employers, so he is personally safe enough regardless of the quality—or lack of it—in the release prints. But his job is not really complete

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Hal Hall

SAYS



The Prize Contest

ELSEWHERE in this magazine will be found a two-page announcement of a contest that should be of particular interest to the serious Amateur movie maker. It is the announcement that this magazine is starting a contest for the amateur which should bring forth some mighty interesting 16 millimeter productions during the coming year.

A first prize of \$500.00 will be given to the individual or club which enters the picture selected by the board of judges as the best. Three other prizes of \$250.00, \$150.00 and \$100.00 will be given the next three winners.

With this monetary inducement, to say nothing of the credit that goes with the winning of any of the awards, the amateurs should put forth a lot of effort during the coming year to produce a winner. This is really a splendid opportunity and the wise amateurs will avail themselves of the chance to show their efforts in picture making. Barring the professional cinematographers from eligibility to compete makes it strictly an amateur affair, and there will be no chance for an experienced studio picture maker to step in with the advantage of his years of experience.

Incidentally, every amateur who wishes to improve his technique and who wants to keep abreast of the times in the technical side of making pictures, would do well not only to be a steady reader of this magazine, but, also to be certain he secures the Cinematographic Annual. The new annual which is due off the press shortly contains a wealth of information that every amateur should secure and study. It is really a magnificent text-book unlike any other volume on the market.

This writer's humble advice to the amateur is to read the American Cinematographer every month and study the contents of the annual. His technique will be improved.

Good News

THE WORLD is getting brighter. Yes, sir.

The recent announcement by Universal Pictures that salary cuts which had been in effect were to be restored was one of the most encouraging bits of news of Hollywood during the past month. Coming just at a time when even the most optimistic of us were beginning to bow the head and think that things looked bad, it did a great deal to restore confidence in the rank and file of the picture industry. What a wonderful bit of news it will be when, after the depression has passed, we read an announcement that salaries are to be increased all along the line. And we are just darned fool enough to believe that is coming.

Advertising

WONDER why so many businessmen always cut down on their advertising campaign when business is bad—and then double it up as soon as they have so many orders they cannot fill them for six months. That is one of the problems we have been trying to solve for a long while. It would seem that the time to reach out for that extra bit of business is when the business is needed. Mr. Wrigley hasn't cut down on his chewing gum advertising—and we bet he has taken the biggest share of the sales of said product. Why not an advertisement in the American Cinematographer? It gets business for others—why not you?

Stray Thoughts

WONDER when the studio pass system for news gatherers will change . . . Remember those good, old days when visitors were welcome in the studios . . . and how they would go back home all pepped up over having seen certain players at work . . . and how said visitors would go to see every picture after that in which said players appeared . . . and would drag their friends along if only to have the chance to tell them how they had shaken hands with the star . . . Oh, hum . . . This writer used to drag in entire women's club membership on the set at the old Biograph studios in New York when he was the publicity dispenser there for First National . . . and after a studio visit the women would drag the husbands to the theatre to see what they saw shot . . . Wonderful weather out here in California right now . . . but you cannot eat the climate . . . so don't come out looking for a job unless your bank roll is a fat one that will stand a long siege. . . There is many a sorry individual in Hollywood whose bank roll was too slender to stand up under the strain. . . That information for those who write ye Editor to find out what chance they have to land a job in pictures. . . Funny thing about this depression. . . 75,000 people attended the football game between St. Mary's and the University of Southern California the other day. . . Maybe they took their last dime to do it . . . can't figure it out. . . Probably a record attendance will be on hand for the world series, too. . . Perhaps all the money is being kept in the sock . . . anyway a few of these big games will get some cash in circulation . . . should help the stores, too, for the ladies will not want to go in last year's clothes. . . Wouldn't it be nice if we could get a 75,000 attendance at a motion picture some day. . . Volume two of the Cinematographic Annual is going to be a wow. . . Don't fail to order yours. . . That's all.



Roaring Waters

Karl A. Barleben



Troubled Waters

Karl A. Barleben



Clouds

Ned Van Buren, A.S.C.



Desert Study

Ned Van Buren, A.S.C.



Desert Study

Ned Van Buren, A.S.C.



Desert Study

Ned Van Buren, A.S.C.

Viewing Pictures Not Harmful to Eyes

VIEWING motion pictures entails less eyestrain than reading a book for a corresponding length of time, says Dr. Park Lewis, of Buffalo, N. Y., Vice-President of the National Society for the Prevention of Blindness, in the September issue of "The Sight-Saving Review" (published quarterly). Discussing "The Cinema and the Eye," Dr. Lewis says:

"Under normal physiological conditions, moving pictures do not cause serious eye fatigue. Since viewing moving pictures is distant vision, it does not demand so great an ocular effort as near vision—such as reading for a corresponding length of time. When eyestrain is caused by moving pictures it is due to one or another preventable condition, such as too prolonged fixing of the attention on a single point, or defective visual function, to a bad position of the observer in relation to the screen, to poor films, improper manipulation of the apparatus, to faulty projection or to improper illumination. With these reservations there is no more harm to the eyes in viewing the moving pictures with modern improved methods than there is in any other normal use of the eyes.

"In a recent inquiry which was instituted by Professor De Feo of Italy and presented to the League of Nations, opinions were secured from leading eye physicians throughout the world. The agreement was general in the views expressed. There are four elements to be considered in an inquiry as to whether moving pictures can in any degree be injurious to the eyes of the observer. These have to do with the quality of the film, with the arrangement of the lighting and the mechanism of the motion, and with the position of the observer. The final and important requirement is that his own eyes shall function normally.

"The first requisite is that the screen picture shall be clear and distinct. The captions and other descriptive matter accompanying the view should be sufficiently large to be easily read and not so redundant that the reading may not be easily completed before it disappears. That the film may be clearly shown depends on several elements. The first is the illumination. This should be adequate but not glaring. A glare is an excess of unfocused light; a sharp unshielded bundle of light rays coming from one side or the other or reflected from the screen itself, or from an unshaded light bulb in the dimness of the playhouse, will cause unnecessary discomfort.

"The arrangement of the scene itself so that glaring reflections are thrown back on the audience is now of infrequent occurrence, as the good producers are employing the assistance of the best artistic and illuminating engineering talent. It is better that the hall in which the picture is shown be not too dark. Strong contrasts of light and darkness are not pleasant and the details of the picture are brought out with even greater clearness in a twilight atmosphere if there are no distracting light sources visible. It is imperative that the film be run through with just the right degree of rapidity to make the images stand out and to move with the deliberation of actual living people.

"The beauty as well as the eye comfort of what might otherwise be an exquisite picture is often ruined by the rapidity with which it is shown. In the exhibition of an instructive picture recently shown in an educational institution of high standing a current of twenty-five instead of sixty cycles was used. This together with some fault in the motor mechanism caused a constant flickering of the light that gave the impression of a picture seen through falling water. The sensation produced was most uncomfortable and soon became fatiguing. The whole effect of the picture was thereby lost and the illusion destroyed.

"It is also important that films be retired from service after a reasonable amount of use. When they become spotted and cracked either from the heat of the lamp or from too long

continued use, they give blurred and indistinct impressions and are neither attractive nor comfortable to look upon. In some of the cheaper picture houses they are used much too long.

"The position which the observer occupies in relation to the screen contributes very much to the eye comfort. If he is too close to the screen the pictures become blurred and confused, and defects are emphasized. The same effect is produced if the picture is viewed from too great an angle from one side or the other. Sometimes these nearer inferior seats are cheaper and are occupied by children whose eyes are more easily harmed by the resulting strain than would be the eyes of older people. Children should not be allowed to occupy these less desirable positions. The best place from which the picture can be viewed is near the center of the hall and directly in front of the screen.

"The final requirement, if the film is to be seen without discomfort, is that the eyes of the observer shall be functionally normal and of good visual acuity. When in the absence of any of the defects above mentioned—in the screen, in the evenness with which it is shown, in the illumination and in the position of the observer—there is still a consciousness of strain which is not occasional but persistent, it is safe to assume that there is present some ocular defect that should be corrected. It may be focal or muscular but it will be found that any other continuous use of the eyes will be equally discomforting. In that event, the eyes should be examined in order that the defect may be found and corrected and the prescribed glasses worn."



Telephoto & Television Co. Acquires Telephoto Corp.

TELEPHOTO & Television Co., newly formed corporation, has taken over the Telephoto Corp., of 133 West 19th St., New York City, which company has been engaged in the manufacture of photo electric cells and television tubes for the past 18 months. It has been supplying Paramount, Universal Sound Systems, Sterling Motion Picture Co., Pulverman Corp., and many others in the sound field with its products, according to an announcement made by R. H. Herschman, secretary of the company.

It is the intention of the concern, Herschman states, to increase its manufacturing facilities for its product as the demand for same greatly exceeds its present facilities and the application for the uses of photo electric cells is increasing daily. The company is manufacturing photo electric cells of the Caesium Argon type which is said to be the latest type of photo cell and has an output many times that of the old Potassium type. In addition to the sound field these cells, he states are used in connection with photo engraving, color matching and smoke detection as well as many other uses.

The personnel of the company includes Nicholas Fabian, formerly connected with the Union Lamp Works and the Televisual Co., R. H. Herschman, of the H. J. Jaeger Co., and Triad Manufacturing Co., and George Albert, formerly connected with the Jenkins Television Co., as engineer for the manufacture of television tubes.



Protect Air Films

FRENCH flying men have taken steps to save all French films of aviation. The "Federation de l'Aeronautique," association of French aviators has decided to create a Cinema League, and to keep all copies of films concerning air events.

NOW THE CHAIN IS COMPLETE

THE gray backing on Eastman *Super-sensitive* Panchromatic Negative completes the long chain of benefits resulting from the introduction of this ultra-speed film. Now the improvement in photographic quality that comes with this film is so pronounced that you simply cannot afford to overlook it. Study this amazing medium—introduced, improved, and sponsored by Eastman. Exhaust its possibilities, if you want to achieve all the beauty of which today's motion picture is capable. Eastman Kodak Company, Rochester, New York. (J. E. Brulatour, Inc., Distributors, New York, Chicago, Hollywood.)

EASTMAN *SUPER-SENSITIVE*
Panchromatic Negative, *Type 2*



KENT DOUGLASS and HELEN CHANDLER

in

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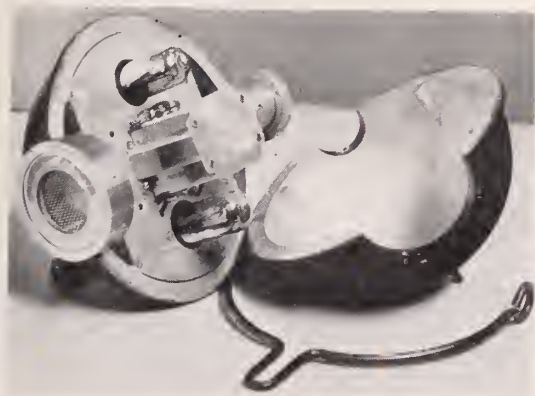


Originator of Audio-Camex
Sound-on-film Recorder

ANNOUNCES A NEW BOMB MICROPHONE



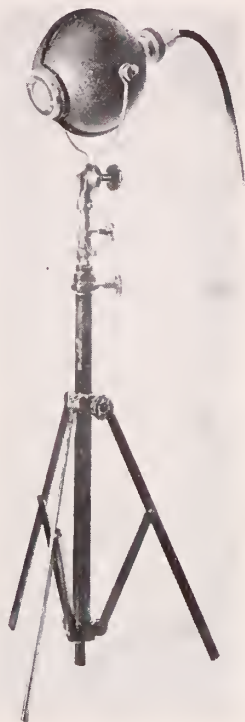
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Interior View of Microphone



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Symposium on 16mm. Sound Film One Feature of S.M.P.E. Convention

AN EXTENSIVE symposium on the problems of 16 mm. sound films will be one of the features of the Fall Meeting of the Society of Motion Picture Engineers to be held at the New Ocean House, Swampscott, Massachusetts, October 5-8.

Some of the papers to be given in this symposium are:—"Description of the Educational Film Experiment in Washington," by Glenn Griswold of the Fox Film Corporation; "Advantages of 16 mm. Continuous Projectors," by J. L. Spence and J. F. Leventhal of the Akeley Camera Company; "16 mm. Optical Systems," by Allen Cook of Bausch and Lomb; "Advantages of 16 mm. Super Panchromatic Film for Educational and Medical Films," by Schwartz of the University of Rochester and Tuttle of Eastman Kodak; "16 mm. Sound on Film Dimensions," by R. T. May of R. C. A. Victor.

Many other papers dealing with many phases of the industry will be read during the convention. On Tuesday morning, Dr. H. E. Ives of Bell Telephone Laboratories will read the paper, "The Projection of Motion Pictures in Relief." H. E. Edgerton of the Massachusetts Institute of Technology will deliver a paper on "The High Speed Stroboscope." An open forum will be held among leading engineers on the subject of "Service to Producers."

On Tuesday afternoon three papers will be delivered on photographic subjects by experts of the Bureau of Standards.

Wednesday morning H. A. Frederick of Bell Telephone Laboratories will read a paper on "Vertical Cut Wax Recording." Another paper will be delivered regarding the new Bell & Howell Printer.

Thursday morning a paper will be given which describes in detail all of the many unique installations in the new Los Angeles Theatre, including a description of the vacuum tube light control and public address systems. Other papers to be read include "Theatre Design and Acoustic Treatment" by Ben Schlanger and V. A. Schlenker; "Resume of International Photographic Congress at Dresden," by Dr. S. E. Sheppard; and a paper by N. D. Golden of the Motion Picture Division of the Department of Commerce.

The Fall Meeting of the Society of Motion Picture Engineers will hold unusual interest this year because it will mark the society's 15th birthday. In addition to the customary scientific program, the four-day convention will give recognition to the anniversary.

Although recent meetings of the Society of Motion Picture Engineers have been held in New York, Washington, and Hollywood, the board of governors selected Swampscott for the Fall convention largely out of deference to the pioneer members of the society who wish especially to attend the 15th anniversary meeting. Some of this number of older men have expressed a preference for a meeting place such as Swampscott, where the pressure of outside business competes less with the society's gatherings.

Next spring's meeting, in the expectation of the board, will again be in a larger city.

New York Section of Society of Motion Picture Engineers Held First Fall Meeting Recently

THE FIRST meeting of this season of the New York Section of the Society of Motion Picture Engineers was held at the Bell Telephone Laboratories, 463 West Street, Friday, September 25, at 7:30 P. M.

The following papers were read: "Screen Brightness" by S. K. Wolf of Electrical Research Products, Inc. and "A New System for Color Photography" by Mr. Frederick W. Hochstetter of the Hochstetter Research Laboratory, Pittsburgh, Pennsylvania. Mr. Wolf's paper was accompanied by experimental tests conducted in conjunction with the audience.

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Reeves Introduces Optical Unit To Replace Recording Slit

IN THE previous issue of THE AMERICAN CINEMATOGRAPHER it was announced that Mr. Arthur Reeves, well known as a cinematographer and as one of the owners of the Hollywood Camera Exchange, had established a new firm known as the Hollywood Motion Picture Equipment Co., Ltd. and was specializing in the manufacture and distribution of recording apparatus and all types of studio and laboratory equipment. At that time it was stated that Mr. Reeves had perfected a new optical unit wherewith to replace the mechanical slit ordinarily used in glow-lamp recorders, and which had a guaranteed frequency range of 10,000 cycles. At that time, no particulars were available regarding this device, but they have since been imparted to representatives of this magazine.

The new Optical Recording Unit is made to replace the mechanical recording slit used in all glow-lamp recorders. It can be mounted in the recording aperture-plate of any glow-lamp recorder. It consists of a microscopically small lens, ground flat on the rear surface, and to a unique double-convex surface in front. This forward surface is such that in profile it is seen to come to a sharp point, while in a plan view this ridge, or point, extends the full width of the sound-track. The film is passed at about 0.001" in front of this point, and is not in contact with it. The action of the unit is to collect the light emitted by the recording tube, and to focus it, in the form of a minute slit, 0.1" long by 0.0007" wide.

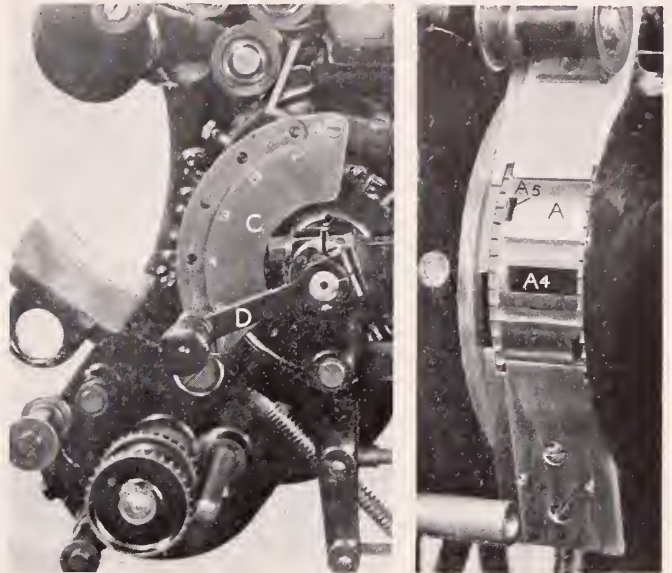
It is claimed that this method of optically creating the required slit produces an image of 100% greater brilliance, thereby increasing the overall possible gain, and making it less likely that an inexperienced recordist will underexpose the sound-track. Mr. Reeves also states that the new unit has in laboratory tests responded to frequencies as high as 25,000 cycles per second; a speed at which the magnitude of the sound-track striations is smaller than the grain of the film. In other words, the potential frequency range which can be recorded with this unit is very greatly in excess of the ranges of either present-day recording or reproducing circuits. Mr. Reeves positively guarantees, however, that with existing apparatus a range of 10,000 cycles may be recorded.

Due to its construction, the optical unit is far less likely to become clogged by dust than are mechanical units—a valuable consideration for commercial and industrial users. Furthermore, this unit, being of an optical rather than a mechanical nature, cannot infringe on any of the several patents controlling mechanical slits, and when used with properly licensed amplifiers should be a protection against patent litigation.

The new unit is not only available separately, but is incorporated in all of Mr. Reeves' new recording units, which, although developed from his well known Audio-Camex recorder, include such up to the minute developments as ground-noise eliminating circuits and the new Pentode amplifying tubes.

Another development just announced by Mr. Reeves is a new duralumin "Bomb" microphone. This device is not only of superior acoustic efficiency, but also of greater all around utility for commercial and newsreel use. It is rather strongly directional, and, due to its mounting, it makes it possible to record close shots of people speaking without the necessity of including the microphone in the picture, as it may be placed below the speaker, and swung upward, in which position it is quite as effective as though it were slung above the speaker on a boom, after the manner of studio recorders—a technique which is rarely possible to the industrial or news worker, due to the lack of portability of most microphone booms.

Bell & Howell Five-Way Sound Printing Attachment



(A) The drum, in which are cut five openings—one full aperture, one each for sound and picture printing for operating the negative forward or reverse; (A3) Sound aperture—reverse run; (A4) Picture aperture—forward run; (A5) Sound aperture—forward run; (C-1-2-3-4-5) Index dial; (D) Lever and pin which move drum to opening indicated on Index dial.

THE BELL & HOWELL COMPANY is making an alternative sound printing attachment which can be fitted to this company's Model "D" Continuous 35 mm. Printer. Instead of having movable masks at the aperture, the five-way attachment utilizes a 220° drum in which are cut five openings. Four of the openings are arranged to take care of printing the sound and picture areas respectively of the negative, whether the negative is running forward or backward. The fifth opening is arranged to print ordinary "silent" negatives. In other words, instead of arranging masks to give the various combinations of aperture openings, the five-way wheel is turned to the correct openings. These openings are indexed to facilitate the operator using them for sound and picture area printing, in correct sequence.

Armoured Film Successful

THE "ARMOURED FILM," which is said to increase life of prints and reduce wear on sprocket holes and emulsion surface of film sufficiently to add at least 100 per cent to the life of the film and maintain "first run" quality, is reported meeting with good results in tests.

The process is the development of the Armoured Films, Ltd., of London, and will be placed on the market through its New York office located in the Chanin building. English and United States patents were developed and acquired by the London company and the experimental machines were manufactured by the Precision Engineering Co.

Laboratory Department

Conducted by EMERY HUSE, A. S. C.

Principles of Sensitometry and Their Practical Application

Part 6

IT WILL be seen from the foregoing article that there were several standards of intensity, all of which were units which depended upon the maintenance of a flame. Also these flame standards were not wholly satisfactory because of the difficulty in maintaining with high precision the unit of luminous intensity. In 1909 the standardizing laboratories of Great Britain, France and the United States reached the agreement that the unit of luminous intensity, which is called the **international candle**, be maintained by a group of carefully standardized incandescent electric lamps. The international candle is a unit of arbitrarily chosen magnitude which is maintained by means of these carefully preserved groups of standardized incandescent lamps. Undoubtedly where the highest precision is required carefully standardized electric lamps are superior to any other form of illumination for sensitometric work. It is necessary that these electric standards be operated under very carefully controlled conditions because it is of utmost importance that precision be maintained from the standpoint of both intensity and spectral composition. The temperature at which an incandescent filament operates is of course dependent upon the voltage. Since the quality of radiation given off by an incandescent solid is dependent upon the temperature of that material, it follows that the spectral composition of the radiation emitted by an incandescent lamp depends upon the impressed voltage or upon the current flowing through the lamp. In using incandescent lamps as standards of photographic intensity it is necessary, therefore, that they be standardized for the temperature at which they operate. This temperature is called the "color temperature" and is defined as follows: "The color temperature of a particular source has been defined as the temperature of a 'black body' which has the same distribution of energy in the visible spectrum as the source under consideration." This term color temperature is of considerable convenience in specifying the spectral composition of radiation emitted by any light source which can be matched by a "black body" at some temperature. By a black body, or total radiator, is meant a body the surface of which will entirely absorb all radiation which falls upon it. Since such a body would absorb all light it would look perfectly black at ordinary temperatures and hence it is called a perfectly black body. The effective equivalent color temperature of sunlight at the earth's surface is approximately 5400°K (absolute). Many of the modern incandescent lamps operate at filament temperatures as high as 3100°K, but it is impossible to make satisfactory standards operating at that temperature. The lamps actually used by the national standardizing bureaus for the maintenance of the international candle operate at filament temperatures but slightly in excess of 2360°K., which is the color temperature of acetylene. It is obvious then that even with standardized electric lamps it is quite impossible to obtain radiation even approximating in quality to that of sunlight.

We will not at this point enter into a mathematical treatise of this subject. It is hardly necessary in a paper of this type. As a matter of interest Table 1 is presented in which are given the color temperatures for the various standards of luminous intensity which have at various times been used as standard sources in photographic sensitometry.

Table 1

Source	Color Temperature (°K)
Standard British Candle.....	1930
Hefner	1880
Harcourt Pentane	1920
Acetylene (E. K. Standard)	2360
Incandescent Carbon (4 w. p. c.)	2080
Incandescent Tungsten (1.25 w. p. c.)	2400

The international candle is maintained in terms of standardized carbon and tungsten lamps and it will be noted that the color temperature in which this unit is maintained is not over 2400°K. and, as previously stated, it is not possible to make satisfactory standard lamps with good precision and life characteristics at filament temperatures much above 2500°K. In Table 2 are shown color temperatures of various sources which are used in practical photography.

Table 2

Source	Color Temperature (°K)
Sunlight (mean noon)	5400
Skylight	1200 to 18,000
Crater of Carbon Arc (ordinary hard cord)	4000
White Flame Carbon Arc	5000
High Intensity Carbon Arc (Sun Arc)	5500
Incandescent Tungsten, 10.0 lumens/watt	2500
Incandescent Tungsten, 20.3 lumens/watt	2985
Incandescent Tungsten, 24.2 lumens/watt	3175
Incandescent Tungsten, 27.3 lumens/watt	3220

It will be noted that these are of much higher color temperatures than those which can be attained in satisfactory standards of luminous intensity.



Copper Oxide Rectifier Introduced By General Electric

A COPPER-OXIDE rectifier, built to improve the growing use of full vision screens, wider films and colored motion pictures, and said to be the first copper-oxide rectifier to be introduced for the motion picture field, has been announced by the General Electric Co.

One of the outstanding features claimed of the new rectifier is that it may be used either for a high-intensity projector or for one or two low-intensity projectors. Used with a high intensity projector, it supplies 60 to 70 amperes of arc current. Operated with one or two low-intensity projectors, each of the two sections supplies 30 to 35 amperes.

The new rectifier makes use of the copper-oxide disc principle of rectification, which is said to give it durability, long life and freedom from maintenance expense. A system of forced ventilation, using radiating fins and two small electric blowers, forces a steady stream of cool air over the copper-oxide elements and maintains a temperature, it is declared, within ten degrees of the surrounding air temperature. No objectionable noise is made by the rectifier, enabling it to be placed in the projection room. Installation and operation of the unit are simple. One switch starts or stops the rectifier instantly, without the usual "starting" or "warming up" period, the company declares.

Hollywood Callboard

As this issue goes to press the following production activities were under way in the Hollywood Studios.

PRODUCER and TITLE	CAST	DIRECTOR and ASSISTANTS	CAMERA and SOUND
COLUMBIA "Unwanted"	Russell Hopton, Greta Granstedt, Dorothy Sebastian, Ian Keith, Lloyd Hughes.	Louis King	Joe Walker, A.S.C.
FOX "Over the Hill"	Mac Marsh, James Dunn, Sally Eilers, James Kirkwood.	Henry King	John Seitz, A.S.C.
"Surrender"	Ralph Morgan, Warner Baxter.	William K. Howard	James Howe
"Cheating"	John Boles, Linda Watkins, Hedda Hopper.	Kenneth MacKenna	Charles Clark, A.S.C.
"While Paris Sleeps"	Victor McLaglen, Helen Mack.	Allan Dwan	Unassigned
MGM "The Mirage"	Joan Crawford, Clark Gable, Wallace Ford, Skeets Gallagher.	Clarence Brown Chas. Dorian	Oliver Marsh, A.S.C.
"Private Lives"	Norma Shearer, Robert Montgomery, Reginald Denny, Una Merkel, Jean Hersholt	Sidney Franklin	Ray Binger Fred Morgan
MONOGRAM "Land of Wanted Men"	Bill Cody, Sheila Manners, Frank Lackteen.	Harry Fraser	Archie Stout
"Two Fisted Justice"	Tom Tyler, Barbara Weeks, Kit Guard.	G. A. Durlam	Faxon Deane
PARAMOUNT "Sooky"	Jackie Cooper, Robert Coogan, Jackie Searl, Willard Robinson.	Norman Taurog Arthur Jacobson	Arthur Todd
"Working Girls"	Judith Wood, Charles "Buddy" Rogers, Dorothy Hall.	Dorothy Arzner William Kaplan	Harry Fishbeck
"The False Madonna"	William Boyd, Kay Francis.	Stuart Walker Jack Mintz	Henry Sharp, A.S.C.
"Dr. Jekyll and Mr. Hyde"	Fredric March, Miriam Hopkins, Rose Hobart.	Rouben Mamoulian Robert Hill	Karl Struss, A.S.C.
"The Man I Killed"	Phillips Holmes, Nancy Carroll, Tom Douglass, Lucien Littlefield, Lionel Barrymore.	Ernst Lubitsch	Victor Milner, A.S.C.
"Ladies of the Big House"	Sylvia Sydney.	Louis Gasnier Max Marcin	David Abel, A.S.C. George Yohalem
"Husbands Holiday"	Olive Brook, Vivienne Osborne, Harry Bannister, Charlie Ruggles.	Robert Milton Charles Barton	Chas. Rosher, A.S.C.
RKO-PATHE "Suicide Fleet"	Bill Boyd, Robert Armstrong, James Gleason.	Albert Rogell Jay Marchand	Sol Polito, A.S.C. D. Cutler H. Stein
"A Woman Commands"	Pola Negri, Basil Rathbone, Roland Young.	Paul Stein	Hal Mohr, A.S.C.
RKO-RADIO "Peach O'Reno"	Robert Woolsey, Bert Wheeler, Lita Chevret, Dorothy Lee.	William Seiter	Unassigned
UNITED ARTISTS "Arrowsmith"	Ronald Colman, Helen Hayes, A. E. Anson.	John Ford	Ray June, A.S.C.
"Sky Devils"	Spencer Tracy, William Boyd, George Cooper, Ann Dvorak.	Edw. A. Sutherland Bill Tummell	Tony Gaudio, A.S.C.
"Cock o' the Air"	Billie Dove, Chester Morris, Matt Moore, Walter Catlett, Luis Alberni.	Tom Buckingham Nate Watt	Lucien Andriot
"Tonight or Never"	Gloria Swanson, Robert Greig, Ferdinand Gottschalk, Warburton Gamble, Greta Meyer, Alison Skipworth.	Mervyn LeRoy	Gregg Toland
"Greeks Had a Word For It"	Ina Claire, Joan Blondell, Madge Evans, Lowell Sherman.	Lowell Sherman	George Barnes
UNIVERSAL "Frankenstein"	Colin Clive, Edward Van Sloan, Dwight Frye, Frederick Kerr, Mae Clarke.	James Whale Joe McDonough	Arthur Edeson, A.S.C.
"Saint Johnson"	Walter Huston, Lois Wilson, Harry Carey, Ralph Ince, Russell Hopton.	Ed Cahn	Unassigned
"Nice Women"	Sidney Fox, Frances Dee, Alan Mowbray.	Edwin H. Knopf	Unassigned
WARNERS-FIRST-NATIONAL "Taxi Please"	James Cagney, Joan Blondell, Ralf Harolde, Geo. E. Stone, Guy Kibbee, Leslie Fenton, Dorothy Burgess, Ray Cooke, Leila Bennett.	Roy Del Ruth Wm. Cannon	James Van Trees, A.S.C.
"Her Majesty, Love"	Marilyn Miller, Ben Lyon, W. C. Fields, Leon Errol, Chester Conklin, Ruth Hall.	William Dieterle Al Alborn	Bob Kurre

THE FIRST ENTRIES in the \$175.00 prize picture contest of the American Cinematographer are seen in the pictorial section of this issue on pages 17, 18 and 19.

THIS CONTEST covers a period of twelve months. A prize of \$100.00 will be given for the picture selected by the judges as the best picture appearing in the pictorial section in the twelve months, beginning with the present issue. \$50.00 for second prize, and \$25.00 for third award.

ANYONE IS ELIGIBLE to compete for these prizes, providing he or she is a bona fide subscriber to this magazine. If you are not a subscriber and wish to submit pictures for this prize section, just mail your check for \$3.00 for a year's subscription and you will be eligible to compete. You may submit as many pictures as you wish. However, if in the opinion of the editor your pictures do not have sufficient merit, this magazine will not print them, and they will be returned to you.

125 Theatres Closed in Philippine Islands

THE WORLD-WIDE business depression has affected the motion picture theaters in the Philippine Islands. A year ago there were 300 picture houses, while today there are but 175 in operation. Seventy of these are wired, the Manila district having 33 of them. Not even the first run theaters are now making money, according to the proprietors. The largest circuit of theaters in the islands is controlled by the Lyric Film Exchange, which has four houses in Manila and forty in the provinces. It also acts as agent for Paramount, Warner Bros.-First National, and United Artists.

10 British Film Studios Use Photophone Recording

TEN BRITISH studios are now using RCA Photophone recording system, it is announced by Van Ness Philip, manager of the Foreign department. The studios include British International, British Lion, Gainsborough, Gaumont, First National Pathe, Mansfield Markham, Associated Radio Pictures (Dean), Teddington (Warner Bros.), Twickenham, Nettlefold. With 14 pictures as the peak in production for the summer period, 12 were recorded by Photophone system, says Philip.

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Ten Reel Commercial

PAT DOWLING and Hobart Brownell of Metropolitan Industrial Pictures have been engaged to supervise and direct production of what will be the largest industrial production made to date, a ten reel talking picture, "MORE POWER TO YOU", which is to be produced for Dodge Motor Car Company by Educational Talking Pictures Company, Ltd.

Production of the picture will be at Metropolitan Sound Studios which is owned and operated by Educational Talking Pictures Company. Arrangements for the production were made by N. E. Wilding of Detroit, representative of Educational in the industrial field in that territory.

The picture will include a cast of thirty professional actors and the action will take place in more than fifty sets and locations. "MORE POWER TO YOU" is to be an organization film portraying various phases of retail automobile dealers' activities and sales methods relating to the Dodge and Plymouth lines.



Photophone Turning Out New Portable Sound Unit

LARGE scale manufacture of an entirely new portable sound reproducing unit, designed primarily for the educational and industrial fields, has been started by RCA Photophone.

The entire outfit comprises a projection machine, an amplifier, a loud speaker and a carry-case for film which have an aggregate weight of slightly over 200 pounds. The equipment is A.C.-operated from an outlet of 105 to 125 volts, either 50 or 60 cycle, single phase power source.

The projector is designed to accommodate a 1,000-foot standard reel, a standard series I theater projection lens with limits of focal lengths of 3¾ inches to 8 inches, a one-thousand watt, 110 volt, pre-focused base projection lamp, a 10 volt, 7½ ampere exciter lamp and a UX 868 photo-electric cell.

Standard 35 mm. film is used and a picture about 8 x 10 feet in dimensions is obtained upon the screen from a throw of 75 feet, the company declares.



Japan Has 1,270 Film Theatres

TOKYO—According to a survey by the "Osaka Mainichi," picture theaters in Japan have increased at the rate of 40 a year since 1896, when films were first introduced in the country. Today Japan has 1,270 picture theaters. Tokyo and Osaka each have ten with sound.



New Amplifier Tubes Offered

TWO NEW tubes known as the 242 amplifier, designed to replace the 211E and said to consist of a long life thousand hour tungsten filament, and the 205D intermediate amplifier said to have an anchored construction to assure noise free projection, is being offered by the Duovac Radio Tube Corp., of Brooklyn, New York.



Wiring Saturation in 1932

WIRING of English theaters will reach the saturation point about the end of next year, at which time the 1,100 houses now remaining silent will either have been equipped for sound or closed, it is stated by T. Drew, sales chief of Western Electric. By the end of the present year only a little more than 600 silent theaters are expected to be open in this country, with probably half of these being worthless as talkie houses, says Drew. At the present rate of progress, equipping of all the country's active theaters will be completed by England considerably before the U. S. achieves that end, according to Drew. After that, replacements and servicing will become the chief activities of W. E.

Twelve Expeditions to Film "Magic Carpet" Series

PLANS have been completed by Truman H. Talley, general manager of Fox Movietone News, for the production of the second series of 26 releases for "The Magic Carpet of Movietone." Twelve expeditions have been arranged by Louis de Rochemont, short subject editor, to cover parts of the world not already reached by staff units in New York, London, Berlin, Sydney and Paris.

One of the units, already in Alaska, is headed by Eric Mayell. Another, which is in charge of Jack Lieb, is in Africa gathering material for three releases. The Lieb unit with Carl Bjerre, sound engineer is working up from Cape Town through the Union of South Africa. Northern Africa is being covered by crews working out of the Paris office. Richard Maedler and Lewis Tappan have secured material for the "Magic Carpet" in the Sudan, Ethiopia and the Belgian Congo. Ariel Varges, pioneer newsreel man, is securing film in the Orient and the islands of northern Japan. James McInnis and William K. Hawk are in India and will tour the Dutch East Indies.

Crews, under the supervision of Harry Lawrenson, are working in Australia, New Zealand and the Malay Archipelago. Ben Miggins, European director, and Russell Muth, in charge of the Paris office, have sent units to Scandinavia, Austria and the Slavish countries. Charles Herbert and a camera and sound crew will shortly start a round-the-world trip in search of material. Canadian and South American territories are also covered by units.

Working titles of the next releases are: "Back to Erin," "City in the Clouds," "In Old Mexico," "A Dancing World," "Byways of England," "An Alpine Playground," "Cherry Blossom Time," "Children of the Desert," "Here Comes the Circus," "Pearls of the Caribbean," "Across the Andes," "Over the Bounding Main," "Sunny Italy," "Paths in Palestine," "Wonders of the World," "Land of the Storks," "Conquering the Sky," "God's Frozen Children," "On the Road to Mandalay," "A Journey to Java," "The Iceberg Patrol," "Off the Grand Banks" and "Along the Amazon."



Free List of Medical Motion Pictures

THE EXTENT to which motion pictures are already serving the medical profession, as well as lay audiences interested in the study of physiology and health and hygiene subjects, is revealed by an interesting survey, entitled "Medical Films and their Sources," prepared for free distribution by Wm. F. Kruse of the Educational Department of the Bell & Howell Company.

Over 450 titles comprising 538 reels of 16 mm. safety film are listed and described. Definite information is also given as to where the films may be obtained, with the rental or purchase price asked by their owners or distributors. Separate classifications list medical-surgical films intended for professional use exclusively, health and hygiene films for lay audiences, and similar films obtainable from university extension divisions and intended primarily for school use. A special supplement lists dental and oral hygiene films.

Copies of this survey may be obtained, without charge, by any medical, surgical, dental, or similar school or society; by hospitals and public health authorities; by any active practitioner; or by educators or school administrators interested in the use of motion pictures in the field of health and hygiene. Applications should be made direct to Educational Department, Bell & Howell Company, 1801 Larchmont Avenue, Chicago.

**Don't Forget
Out In November
Volume 2
Cinematographic Annual**

Amateur Movie Making

by WILLIAM STULL, A. S. C.

PROMINENT among the questions which a professional cinematographer is almost certain to be asked every time he encounters one or more of his amateur confreres is, "How do they make animated cartoons?" Immediately it will be followed by, "and can I make them, too?"

Mickey, Felix & Co.

Theoretically, anyone who owns a motion picture camera can make animated cartoons—provided, of course, that he can draw, or command the services of somebody else who can. In actual practice, he can do it only if he has a camera which can be made to expose but a single frame at a time, and stop immediately thereafter (without fogging the next frame), and repeat the performance with adequately long intervals between the exposures.

An animated cartoon is, after all, only a moving picture. But instead of being, as a conventional motion picture is, a series of still photographs, made successively, of a moving object or scene, an animated cartoon is a series of still photographs, made successively, of a series of drawings, each of which has in it such slight differences as will cause the result, when projected in the usual manner, to give the illusion of movement. In other words, the animated cartoonist must draw an actual picture of each frame of his film, and then photograph those pictures, one frame to the picture, on cine film.

This sounds like a great deal of work. It is! The next time that you sit comfortably in your theatre and enjoy the antics of Mickey Mouse, just remember that to produce that 600 or 800 feet of film, from 3,000 to 6,000 or more individual drawings had to be made—and photographed in the right order. Then marvel at the fact Mr. Disney produces on the average two complete Mickey Mouse films and as many "Silly Symphonies"—every month.

Short Cuts

But of course this sort of volume production could not be possible were it not that many short-cuts are possible. These short-cuts have chiefly to do with making it unnecessary to make complete drawings for every frame.

Let us imagine a simple scene. Mickey, or Martin, or Matthew Ethelbert—or whatever we may choose to name our character—is standing in the middle of a street. He is going to raise his hand to his head in order to lift his hat to Minnie, or Martha, or Matilda (or what have you). Now, it is going to take a dozen or more drawings to make him do this—and we don't at all like the idea of drawing Mickey, his hat, the street, and everything else in the picture a dozen times just to make him be polite to a lady. So what do we do?

We study the picture. What is going to have to move, and what is going to remain motionless throughout our dozen drawings? Let's see: the street certainly won't move; neither will Mickey, except for his hand and his hat. Therefore, can't we make one drawing do for Mickey (all but his hand), the street, 'n'everything? There's an idea! But how can we do it? Simple enough! We draw the street on a piece of paper, using India ink. Then we draw Mickey on a thin piece of transparent celluloid—also using India ink. But if we put Mickey on top of the picture of the street, some of the background may possibly show through Mickey's white portions, which would be very embarrassing. So we carefully turn Mickey over, and apply Chinese White to the back of those white portions which are likely to be embarrassed. Next, we make the appropriate drawings of Mickey's arm in the different

positions it will occupy between its starting-point and his hat. These, too, are made on celluloid—"cells" to you, for short—and, if necessary, also backed with Chinese White. Then it will be simple enough to place Mickey (on cell) on top of the street (on paper), and Mickey's arm (on cell), on top of both, and photograph them, changing only the arm between movements.

But hold on! If we aren't terribly careful, we won't be able to keep them all "in register"—we'll be having the street doing acrobatics all over the place, while Mickey floats serenely around, and his arm waggles up and down somewhere else entirely, quite unattached to its proper body. That will never do! So we get around this by putting two pins in our drawing board, and two more in exactly corresponding places in our photographing-stand. Then it is simple enough to have our paper and cells all punched with holes to fit onto these pins, just as the sheets in a loose-leaf notebook fit onto the rings in the book. And another major catastrophe is averted.

But now, suppose we have another scene: Mickey is walking along the street, and we are following him. Can't we take some short-cut here? Of course we can. In this case, the effect that we want to create is that of Mickey and the camera moving along, and the background remaining stationary. Well, can't we get the same result by keeping Mickey stationary (the camera can't move, anyway!) and letting the street move along behind him? Of course; let's try it. We draw the background on a long strip of paper, with many closely spaced pairs of registering-pin holes at the top. We draw Mickey again on a cell—all but the legs. Then we draw the various positions of his legs on another series of cells. And we can proceed to photograph them as we did before, except that we must remember to move the background one pair of holes each time.

Now, of course, these ideas can be elaborated to take care of several simultaneous movements, such as arm-movement, leg-movement, and facial expressions; any combination, in fact, can be secured by adding cells. Naturally, there is a limit to the number of celluloids that we can interpose between our paper backing and the lens before the picture begins to go gray; I have found that five cells are as many as can generally be used successfully. Fewer than this are always desirable. The same cells, by the way, can be washed and used over and over again. Mr. Disney uses his a year, and then only changes them "for safety."

The Gentle Art of Animation

It is easy enough to talk about "stages of movement," or "phases of animation"—but it is quite another thing to actually draw them. Obviously, one can't draw out every possible position between the extremes of a movement; just as obviously, one can't suppress too many of these positions. If we don't have enough of them, the action will be too fast and jerky; if we have too many, it will be too slow. The business of striking the happy medium between these two is called "Animation." There's really quite a trick to it, but practice (including, as it naturally will, lots of mistakes) if it won't in this case make perfect, will at least develop some of that knack. A very helpful—in fact, indispensable—device, is what is known as an animating table. This is simply a drawing-board with the center cut out, and replaced by a pane of ground or opal glass, under which is a light. The drawing is made on this, with the light turned off. Then the next drawing is made on top of this, with the light on; a great deal of the previous drawing can often be traced, and the proper position is much more easily ascertained. If, when the second

drawing is completed, you are in doubt as to whether it is right or not, it is easy to turn the light off, and, viewing both drawings by reflected light, flip them back and forth: if the movement seems to be correct, you can be sure that it will photograph properly.

The important point in animated cartooning is, of course, making the drawings funny and simple, and in getting the animation right. The funnier the drawing, the better—but it must always be simple: just as few lines and masses as is possible. Stay away from delicate half-tones. They're hard to match. Make your action incongruous: it is funnier. I recall one sequence in an early Disney cartoon which illustrates this very well. A cow ate a daisy. Nothing particularly funny in that, is there? But suppose the cow stalks the daisy as a cat stalks a mouse, crawling toward it on her belly, with tail switching sinuously. Then suppose that the daisy pirouettes off, like a ballet-dancer, and finally runs up a tree—followed by Mme. Cow, who finally catches her prey, and lies comfortably on a limb, munching away. Properly drawn, such action packs a big laugh. . . . There is an old saying among animators that one doesn't necessarily **have** to be crazy to be a good animated cartoonist—but it is a big help!

Photographing the Drawings

Now let's be technical. How shall we photograph these drawings? In the first place, we will need a camera that is either capable of being worked one frame at a time, or that is equipped with a hand-crank attachment. If the latter, we must have some means of turning the shaft just sufficiently to expose one frame and close the shutter each time. This is simple enough, for a special shaft can be fitted in place of the crank, and mounted with a gear or pulley arrangement so that when we turn another crank around once, the camera shaft will revolve through the proper arc. If it is an 8-pictures-per-turn movement, $\frac{1}{8}$ turn; if it is the so-called "trick movement" with which some few 16mm. cameras are equipped, one full turn. Then, of course, there must be some device for preventing the crank from turning backward, and fogging our film, and, if you want real convenience, a revolution counter to show how many frames have been exposed. For the best, professional-quality work, a motor drive should be attached to this gearing, through a clutch, so that we make our exposure automatically by pushing a button. This is a big time-saver, and ensures perfect uniformity in exposure.

The camera should be mounted in one place, preferably pointing down. Below it, at a fixed distance, should be the support for the cartoon. It is best—though not imperative—to have this a large table, so that the drawings of a series of movements can be spread over it for handy use. The actual ones being photographed should be mounted in a sort of frame. At the bottom, a flat board, equipped with the registering pins. On these, the drawings. Over them, a hinged cover, with a plate-glass window through which the drawing is photographed. This window is important, for it will hold the cells flat. Incidentally, if the cells are too thin, they wrinkle; on the other hand, if they are too thick, they are less transparent, and only one or two can be used. The lighting should come from two sources, placed above the board, and equidistant from the center of the picture. They should give a soft, uniform light, and one that is neither hot nor tiring to the eyes. Therefore I believe that, for professional results, the Cooper-Hewitt Mercury-vapor tubes are the best (use the short "M" tubes—the others are unnecessarily long); for ordinary amateur work, however, incandescent globes, equipped with tracing-cloth diffusers, are quite satisfactory, even if they are hot to work under. Positive film is by long odds the best, as it is not only cheaper, but gives contrastier results. Delicate gradations are not wanted, and, since you are using only black, white, and gray in your subject, color-correction is not necessary. Positive film is plenty fast enough; in fact, you will probably have to stop down somewhat.

More Animations

But cartoons are by no means the only subjects for this sort of work. There are endless possibilities in the way of animated

dolls and models. The Kodak "Children's Cinegraphs" are examples of this: Chip, the Wooden Man, and his playmates are made this way. In this case, of course, the camera is horizontal, and we must make miniature sets. This type of work can give a great deal of valuable experience in lighting, by the way, which can in some measure be applied to the photography of full-size subjects. If our dolls or models are in monochrome, we may still use positive film; if they are not, negative or reversal stock. Super-Sensitive is very useful here, as we can get a lot of lighting effects with nothing but very weak household bulbs.

All in all, animation is a most fascinating bypath; but, a word of caution—if you haven't the patience of Job, don't try it!



New 1 Inch F 3.5 Lens and Waist Level Viewfinder Are Announced For Filmo Cameras

TWO INTERESTING new accessories for Filmo 70 cameras are announced by Bell & Howell. One is a new Cooke 1 inch F 3.5 focusing mount lens, and the other a waist level viewfinder.

The new lens is radically different from the former focusing mount lens for this type of camera. The principal feature is that the focusing and diaphragm dials project out sufficiently into the field of the finder to enable the user to observe his focusing graduations as well as the diaphragm graduations when looking through the finder tube.

The movie maker thus has before his eye a constant reminder to make sure that the distance setting has been changed between shots if the distance has been changed. Quite often, for example, after a close-up has been made, the photographer forgets to change his focus when he shoots a picture at normal distances. This new mount gives him visual notice to make the necessary changes.

Another feature of the new lens is that the front cell is non-rotating. When the focusing diaphragm is turned, the whole lens moves on a spiral without revolving the glass elements. This makes it possible to employ all the attachments which have been developed for the 1 inch F 3.5 lens, such as the distributor, duplicator, duplex filter, and sky filters.

By means of three small screws the graduated portion of the mount can be turned to line up with the finder regardless of the position in which the graduations happen to be when the lens is screwed into the camera.

The second new accessory, the waist level viewfinder, enables the Filmo 70 camera user to determine his picture areas while holding his camera at any level lower than the eye. This facilitates taking those interesting unusual-angle scenes, such as "worm's eye views," without assuming an uncomfortable position. The new unit is not designed to replace the regular viewfinder, which is better fitted for general use, but merely to supplement it when special scenes are to be taken. It consists of two lenses and a prism mounted in a suitable holder which easily attaches to the camera door just above the regular finder. The field is the same as that covered by a one inch lens, but fields of other lenses of longer focal length can be etched on the face of the prism.

To attach the finder for the first time requires the use of a screw driver and possibly a file, but any one can do this work and do it quickly. After this first simple adjustment, to attach or detach the finder requires only a second or so.



1. A cross at Concarneau. 2. A "gate" of stones. 3. A cross on a Menhir. 4. Bois d'Amour, Pont Aven. 5. Market day, Pont Aven. 6. and 8. The River, Pont Aven. 7. A Catafalque.

Babbling About Brittany

by LAWRENCE GRANT

This is the seventh article of an unusually interesting series which Mr. Grant has written for this magazine. The next will appear in the November issue.—Editor's Note.

IF THERE is one thing that the peasant French, and particularly the Breton peasant, thoroughly enjoys it is the display and grief attaching to a death. The house will be swamped with black drapery, the near kin hidden and suffocated with black crepe, the hearse will be drawn by horses looking like black-velvet-caparisoned medieval chargers, and the hearse itself will be a nodding ark of black ostrich plumes. Then when we get to the church we shall find a catafalque on which to place the coffin, which will be of dead black and be covered with all sorts of unpleasant reminders of what has or will become of the deceased. These will include a funeral urn, though of course cremation is unknown, or at least unpractised in such a Catholic community, a Times hour glass, a scythe with which Time mows you down, a spade to bury you with, and a few skulls and crossbones to show you what will be left of you, and sometimes, in a more cheerful vein, a few little designs representing the soul going up to heaven.

A funeral makes a great day, and everyone is going to enjoy to the full every miserable and unhappy emotion that can be squeezed out of it. I remember a man once who went to a funeral, and on returning said that it would have been all right, but they put him to ride in the same coach with his Mother-in-law, and so "spoil the whole day" for him!

I wish I had space to do justice to Pont Aven, but cram the two pages of photographs, which go with each chapter, as I will, I can only select a few of each place from my negatives.

Pont Aven,—town of lovely rivers. Rivers and rushing rivulets. It used to be called the town of forty mills and fourteen houses. Most beloved spot of artists in all France. Artists from every country. You may be in the company of any dozen artists in any place in the world, and to one at least, probably more, Pont Aven, the Bois d'Amour, and Madame "Julia" will be familiar names.

Those two little streets of water, Venice-like, are but samples of literally hundreds of such charming little bits of beauty. Wherever you turn a picture ready to be painted.

Market day here is very picturesque owing to the particularly large and effective bonnets worn in these parts. My picture was taken at a busy hour. What is the first thing you notice? **Women**—women—women—all women. A mile of women, chatting—bargaining—exchanging "potins." And where are the men? They are in town. Certainly, for they drove the women in from the little farms. And after that strenuous exertion they need refreshment, and so they are not visible, just two of them only in all this crowd, for on inspection I found the dog in the foreground belonged to the predominant sex.

But, O, dry American, do you see on the right a magic word painted on the side of the sizable building? **Buvette**. There are the husbands inside, and there they will probably stay, all day.

This is the life. Work hard all the week. Get up at cock-crow every day, and one day a week drive into town with your produce and your wife,—for she will be a better bargainer and merchant than you can ever be. Set up her stall. Lay out the vegetables, and the butter and the cheese and the chickens and the eggs. Then make a bee line for the Buvette, meet your cronies and drink and talk and eat till afternoon. Then gather up the money from your wives, pack up the stall, throw your wife and probably a daughter into the cart and back along the road home, the horse will be alright left alone to

find the way, you can doze, in fact by now you probably cannot help it, and thus ends another darn dull hard working day.

The Bois d'Amour, the River Aven, the Moulin du Plessix, all bring memories of Pascaline. Poor soul, she had a rendez-vous with her lover here, years ago,—but he did not come because he was killed in an accident, and she waited all day and into the night for him. As she has waited every day since. You will probably find her there still for she was not so old when I met her, hunting up and down the river bank, walking and occasionally breaking into a run as she spies some man with a vague look of Him she searches for. She will hurry up to you, and ask you if you have seen him, beseeching you to say that you have met such an one as you came along. Then hurry away muttering to herself. And this goes on day after day, year after year. Poor Pascaline.

Not far from Pont Aven we can leave all churches aside and go right back to Paganism, from which remember Brittany only emerged in the 17th Century! And nowhere in the world can the wisdom of the Catholic Church be more plainly discerned than in this country and in this very matter. They knew that it would be impossible to eradicate entirely all the superstitions, (that is if they are superstitions, though no one knows for a fact what is superstition and what is true,) so they absorbed them, and by absorption they gradually caused them to disappear into Catholic ritual and practice.

Only in some places such things die hard. At Quinipilly, and here in the Stone Country, there be many practices performed on moonlight nights that would shock Comstock, and gladden the heart of Earl Carrol.

The Goddess of Fertility is approached in these parts in a more public and spectacular way than at Quinipilly, and I have a friend here in Hollywood, where I write this, who can bear eye witness testimony to the fact that the ceremonies I suggest actually take place today.

So we come to the Stone Country. A district of megalithic remains that defy all attempts to correctly date or interpret them, for they have been said to be everything from Roman tombs, which is absurd, to petrified soldiers, which is legend.

The first curiosity that strikes any quick observer is that the use of stone persists so strongly that frequently field gates are made in the very primitive way of building up a stone wall. Every time you drive a flock in you take down the wall, and when you have herded in the last animal you build it up again. And you do this every time, so often in some cases, and so old are the stones that form the entrance, that I have seen the center stones which are most often moved have been worn into almost perfect spheres. This I have seen in Portland, England, which is the only other place where I have found these stone gates though I do not doubt you can find some in Derbyshire also.

We find here every few miles giant monoliths, either standing in solitary majesty in the center of a field, or in large groups.

Menhirs. Dolmen. Cromlechs. Alignments.

The words are practically the same in every country where Druids gathered. Brittany—Cornwall—Wales—Derbyshire—Wiltshire—Ireland. They are all Gaelic words.

Menhir. Men, a stone—Hir, long.

Dol, a table.—men, a stone.

Crom, crooked,—Leac, stone.

Every statement as to the origin of these stones is as good a guess as another. The only thing sure is that they are of immense size, great antiquity, and that they were brought from great distances, for no stone of similar kind is found in the neighborhood. And this applies to Stonehenge in England.

And one other sure thing is that they are of religious significance, though of what religion is again in the realm of doubt.

Many are covered with hieroglyphics, which have defied translation.

The setting up of a stone or stones as religious symbols is as old as man's first desire for supernatural help.

Rough unhewn monoliths, simple pedestals without human form, but with rudely carved indications that they represented anthropomorphic Gods and Goddesses, and attributes carved or affixed to indicate whether God or Goddess; Pillars of Pan, having a carved head on a square pillar with masculine indication, came next, and all these, from the crudest to the most modern symbol, can be traced to man's earliest days of worshipping that which created us.

In some centuries the emblems became realistic in the extreme, but later times have refined and conventionalized it all so that these religious symbols can only be recognized as to their origin by those familiar with the transitions from crudity to verisimilitude, and from that to aesthetic conventionalism.

But the symbol remains the same no matter how you may emasculate it, and by whatever euphemistic title you may call the Divinity of any race or religion it is always the **Creator** that is the object of their worship, and the be-all and end-all of their creed.

The recurrence of the "setting up of stones" is so frequent in the Bible and of such familiar knowledge as to need no specific reference. Bethel—Joshua at Jordan—Peter—"for on this Rock I will build my church."

Then we have Lia Fail, or the Coronation Stone sometimes called the Scone, on which all Scottish Kings were crowned, and which now is set in the woodwork of the Coronation Chair in Westminster on which all British Kings are crowned.

And don't we all sing "Rock of Ages?"

So stones have always been associated with religious rites and customs.

These groups and monoliths occur in every country, but France leads the world in number of specimens, there being about 1600 isolated Menhirs and 50 alignments in different localities.

While Stonehenge is probably the most perfect and spectacular single group, Brittany has by far the largest and most complete in the world. And this district, Carnac—Auray—Loc Mariaquer is thick with them.

In the illustrations I have placed a market-square Cross opposite a Menhir, which, in recent centuries, has had a Cross put on the top to redeem its pagan and fleshly appearance a little. But look at the general resemblance, and then look at the resemblance between the church tower a few chapters back and the menhir there. And remember the appearance of all church towers of this "round tower" period especially, and the minarets of mosques and the towers of Hebrew temples, they all have a similar origin, and that origin is the same as the old English Maypole, round which the maidens and the young men danced, for just the same reason as our

midnight festivals are still held at Carnac and at Quinipilly in this year of Grace 1931. Absolutely yes.

At Menec is the celebrated Alignment of Menec, and close to this is the Alignment of Kermario. These are the largest group in the world. Both consist of monoliths placed in rows, about equidistant from each other. Both have large stones at the head of each group, which were sacrificial altars (human) furnished clearly with large hollows to receive the victim, and scuppers for their bloody purpose.

At Menec there are 1170 Menhirs in 11 lines. They start at one end standing about 30 feet high, then gradually decreasing till at the other extremity they are but 3 or 4 feet above ground.

Then a space of perhaps 300 to 400 yards and the alignment of Kermario starts, having ten rows and 982 Menhirs comprising it; again a short space and the alignment of Kerlescan begins in 13 rows and 570 Menhirs.

If you get a youthful or an aged resident to tell you about them he will assure you that Saint Cornelly, being hotly pursued by Roman soldiers wishing to kill him, fled before them towards the ocean. When he came to the sea it was evident that he was to be captured, so he faced his pursuers and with uplifted hand called upon God to save him. The pursuing soldiers were immediately turned to stones, and there they are to prove it.

As a good example of Menhir let us look at this fallen giant, or a portion of him, for he was thrown down and broken into four fragments in the 18th century during a storm of lightning and thunder. The whole stone is about 22 yards long and weighs about 342 tons. The piece showing is about 12 yards long.

I have always thought it unfair to call so splendid a thing by a name that may translate as: "Peter, the Fairy"! Surely so smooth granite-strong a thing that has retained its rigid dignity for centuries, only to be broken, though unbent, by the hand of Heaven itself deserves better fate than the "fairy" class!

Adjacent to the Cromlechs and Menhirs are the Dolmen. Of these there are quite a number hereabouts.

I think the Dol-ar-Marc'hadourien or Merchant's Table is the best of all. One of the stones in the interior of this is covered with undecipherable and hieroglyphics. The top stone is poised on three other stones with a delicacy so extraordinary as to leave one wondering how it has remained there through the ages. And it practically dead level. How did they handle monoliths of such vast weight?

The interiors are small, and consist of only one chamber. They are only a few feet under ground. No one can say what they are or to what use they were put. Tombs, Priests' meeting houses, places to prepare the sacrificial victims? No one knows.

Showing how entirely speculative and a matter of personal opinion all solutions to these stones are, no less an authority than the Encyclopedia Britannica on pages 955 and 956, 13th edition, says that the theory that the Dolmen might have been altars is refuted because care has been taken in every case to place the smooth surface of the stone on the inside, and that the tops therefore could not be used as altars; whereas the photo I show here of the Merchant's Table has the smooth and level side on the top exterior, which would admirably adapt it for an altar.





1. Broken but unbent. Men-er-H'roeck. 2. Dol-ar-Marc'-Hadourien, or The Merchant's Table. 3. Interior of a Dolmen. 4. The Alignment of Menec. 5. Interior of the Dolmen of Mane-Keriaval. 6. Sacrificial Altar of the Alignment. 7. Dolmen of Mane-Keriaval.

Emery Huse



EMERY HUSE, A. S. C., technical editor of the American Cinematographer, has left Hollywood for an extended trip east. He will spend most of his time at Rochester at the Eastman Kodak Laboratories. He will also attend the fall meeting of the Society of Motion Picture Engineers. Many interesting features may be looked for in his department on his return.

New M-R Lamp

MOLE-RICHARDSON, INC., this month announces another new lamp to the trade. It is called the "Handilamp," and an inspection of it reveals the fact that the right name was selected.

The lamp is universally adjustable to all angles. It can be adjusted from ten feet down to the floor, making it particularly adaptable for closeup work. It is very light in weight, being constructed of aluminum alloy and should prove a great aid to the cameraman.

Another feature of the lamp is the fact that the intensity illumination is adjustable. It uses a 1000 watt T20 bulb.

Telephoto For Big Games

WITH FOOTBALL season now in full swing, amateur movie makers will have an opportunity to secure a lot of thrilling scenes at the big games. However, one of the most necessary items to take along is a telephoto lens. With one of these lenses you will be able to get the closeup of that particular play which may be the turning point of the game. Without it you will have an interesting picture, but if you happen to be far up in the stands you will miss a lot of real excitement. Next winter, or next year, when you are showing the picture you will be much happier if the telephoto has been made.

New Portable Recorder

(Continued from Page 13)


scenes were made with a nice little forty-mile-an-hour gale to help us.

"When we went into the battle scenes, the delicate galvanometer of the recording unit certainly got a good test. When we were set up beside the four-inch guns of the destroyer—and the guns were banging away merrily—the recorder came in for plenty of shocks, whether we were recording or not. We had half expected trouble—but we had none. And our records of the gunfire were excellent.


"Most of the key scenes of the picture were played on these boats, so the recording simply had to be good. The only difficulty that we encountered was one in no way due to the recorder, but to the nature of our location; this was in the matter of placing our microphones properly. On the clippers, of course, there was sometimes room enough to use a small, semi-portable microphone boom; but on the destroyers and the sub we couldn't use it, and had to set the mike up on a stand, often in rather poor positions. And, of course, those iron boxes that they call destroyers aren't always the best subjects acoustically! But we got our picture! And not only did we work in places and conditions which would have been utterly impossible in the early talkies, but we worked in ways which would have been equally impossible, for Sol Polito, A.S.C., who was in charge of the photography, tells me that, thanks to the baby recorder, he was able to work his cameras as freely as ever he did in the old silent days."

Ries Bros. to Feature Home Movie Equipment

ONE OF the most complete lines of 16 millimeter motion picture equipment to be found in Hollywood is the present plan of Ries Bros. Inc., photographic supply store on Cahuenga Ave., according to Park Ries, who is in active charge. A projection room and other accommodations for the use of the amateurs will be installed. Amateurs will be welcomed there and every bit of cooperation possible will be given them. Park Ries will be on hand always to advise on any problems. His many years of professional experience will be of benefit to many amateurs.



attention



Volume 2 of the Cinematographic Annual will be off the press in November. Price \$5.00 per copy—and worth it.
Order NOW.

The Cine Camera and the Dance

by PHILIP NEWBERG

UNDOUBTEDLY every cinematographer has at some time or other attempted to make motion pictures of dances. It is equally certain that most of us have failed miserably at it. Yet why, we ask ourselves, should we fail? Is not the dance, like the motion picture, primarily a visual art? Why, then, have we been unable to capture the essential spirit of the dance in our films?

These questions are easily enough answered if we are willing to face the facts; but to do this demands an abrupt **boulevard** in our mental attitude. The fact is that we have been regarding the problem as one of enhancing the dance by our cinematic skill, rather than merely being content to make a faithful record of an already complete artistic unity. And the Dance is just that: a complete artistic unity. Granting, of course, that the choreography and performance are properly executed, every dance is in itself a complete pictorial and dramatic conception. And the majority of our failures come from ignoring this fact.

The Dance is essentially a story expressed in rhythmic pantomime, usually to the accompaniment of music. The dramatic structure of the story is brief—almost telegraphic. Every movement is significant; essential. Therefore, no detail may be omitted in our photographic record, if it is to be an adequate one. Similarly, since the Dance is a fully developed dramatic form, it has its own means of emphasizing its salient points; therefore there is almost never any excuse for the intrusion of cinematic trickery for this purpose.

Having progressed this far—being decided to make a cinematographically simple, straightforward record of the dance—we have progressed far. But, we will soon find, by no means far enough. We are seeking to make a cinematographic reproduction of the dance; we have succeeded so far in making only a visual record thereof.

What is lacking?

Music—the means by which the rhythmic structure of the dance is emphasized, and the whole differentiated from pure pantomime into a distinct and complete Art-form. True, there exist occasional unaccompanied dances, but these are almost invariably self-accompanied by means of accented foot-beats, castanets, and the like. Music in some form must therefore be considered an integral part of every dance; therefore it must necessarily be included in our cinematic reproduction.

This, of course, presents no problem to the professional cinematographer who has at his disposal many types of talking picture recording apparatus. But it does present grave problems to the amateur cinematographer, or to the professional photographer who, like this writer, attacks the problem on a 16 mm. basis. For such workers the problem is not one of making a record of the dance and its musical accompaniment, but of making a record of the dance and perfectly synchronizing it to its appropriate music.

There are several ways of doing this. One may synchronize the dance itself with an accompaniment played not only during the making of the film, but also at each time the film is subsequently projected. If the occasion warrants the rather considerable expense, one may make the picture by this method, and then synchronize the accompaniment through the making of a disc record, perfectly synchronized with the final print, and reproducing the completed work with one of the several 16 mm. sound-on-disc outfits available. Or one may revert to the methods used by the makers of the first talkies—pre-recording. In this case, choosing an existing, commercial gramophone record, suitable to the dance, and then rehearsing



Norma Gould in a dance pose from one of Mr. Newberg's films.

the two until perfection is reached, and then photographing the dance as performed to the accompaniment of the record, later projecting it with the same record for accompaniment.

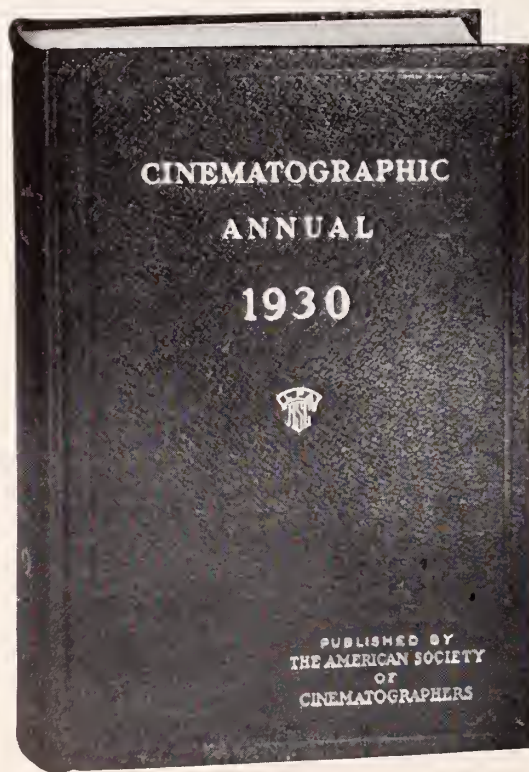
Of these, the first method is generally the most successful. It comes nearer to assuring the required perfect synchronization than anything except, naturally, the actual recording of the sound at the same time as the picture is made. The second method gives equally fine results, but at so high a cost as to be in most instances quite prohibitive.

But in any event, the keynote of success both with the musical and visual portions, is—rehearsal. Painstaking, detail-perfecting rehearsal. Perfection in anything is merely the sum total of perfection of details; even more so in this work, where the smallest details are so vital. This rehearsal is a tiring, time-consuming process, but it is well worth it. Anything is worth while if it results in a perfect picture.

From my personal experience—and from here on bear with me if I use the personal pronoun more frequently than is strictly modest—I think what every cinematographer must have is a sympathetic knowledge of the dance. As I have said, every dance has its story to tell. Obviously, the cinematographer cannot get the best results if he is not perfectly conversant with that story. He cannot regard the dance as a mere sequence of pictorial capers and posturings—and hope to secure a film showing it as more than that. Yes, he must know the story that the dancer is trying to tell. More than that, he must know something of the means by which the dancer expresses himself. He must know this because his pic-

(Continued on Page 39)

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Cine Camera and The Dance

(Continued from Page 37)

ture must, above all other things, be true to the Dance. He may at times be forced to sacrifice composition and lighting to this; but if he finds that he has to do so, he must do it willingly, knowing that it means the difference between a merely beautiful scene and a faithful reproduction of his subject. And dancing is the one subject in which photographic flattery is out of place.

Once knowing what to get, the question is: how to get it. The technique is simple enough, as the story is best told almost entirely in long-shots. But the time element is a complicating factor; your Filmo or Cine-Kodak will allow you but 30 feet of continuous action—and most dances require a hundred feet or more! So what can we do? We might, of course, use a hand-cranked camera; but that will rob us of the beautiful regularity of the motor-drive, which is so important in the portrayal of rhythmic subjects. Personally, I have found that the only satisfactory method is to admit the disadvantage; to plan each picture so that it may be broken up into 30-foot units, and photographed unit by unit. This requires infinite patience, careful planning, and still more careful rehearsal. But it will give you good pictures. Naturally, the units should overlap each other a foot or so, in order that they may be cut into a continuous, apparently unbroken sequence. This technique, of course, necessitates a tripod; but even if it did not, the tripod would still be necessary. I frequently use two cameras simultaneously, as a matter of precaution. At times, it is advisable to use one of the cameras to cover some other angle of the action; but this is rare. The simplest picture is the best. The dance is the thing, and, although, of course, the photography and composition should be good, there should be no striving for unusual camera-angles nor montage-technique.

The photography, composition and lighting should be simple and straightforward, but not obtrusive. Most dances create their own compositions from instant to instant; therefore the photographer's aim should be merely to accept these compositions, rather than to attempt to better them. If the setting can be used to enhance them, without detracting from the dramatic values of the dance, so much the better; if not, it need not matter. Many dances can be performed out of doors, and the natural settings in themselves serve to make the film more attractive. When the dance must be performed indoors, the setting should be as simple as possible. It is noticeable that the majority of the great dancers of the day rely very little upon setting, preferring to create a mental image of their background through the perfection of their Art. The cinematographer should recognize this, and plan his photographic details—cinematics, composition, setting, and lighting—so that they serve as a mere incidental background to the dancer's Art, much as do make-up and costuming in the dancer's appearances on the stage. When working out of doors, naturally the essential rules of photography should apply, inasmuch as working at hours that avoid top-lights, and the use of back-lighting, reflectors, etc., for modelling, need not detract from the dramatic purpose of the picture, and can enhance it. The same should apply in interior work; the lighting should be simple, pleasing, and technically perfect enough to display the subject attractively—but never obtrusive as lighting. Special effects can at times be worked in to good advantage. I recall one of Norma Gould's dances which I photographed, the plot of which required a shower. I managed to create a shower for the picture, which greatly enhanced Miss Gould's pantomime. But such instances are, naturally, rare.

In conclusion, let me advise anyone who would attempt to make such films to begin with the simpler dances, and work up from them. There is sufficient complication even in the simplest ones! Above all things, know your subject. You may be able to produce pictorially perfect films; but unless you take the trouble to learn enough about dancing so that you will at least know what you are trying to portray, you cannot succeed in making even adequate reproductions of dances. Most of all, be painstaking. No detail is too small.

Perfection requires attention to every minutest detail; and, although few dancers may know a great deal about photography, they are specialists in their own field, and uncannily quick to recognize any slighted terpsichorean detail. And since, in the long run, you are making these films more for the specialized audience of dancers than for anyone else—even yourself—hew to the line of strict technical accuracy, even if at times you feel it makes you slight photographic and pictorial quality.

Deep Stuff



FROM ENGLAND, Len H. Roos, A. S. C., F. R. P. S., General Manager of the Tanar Corporation, sends the above photo. He says it shows him and Frank Alexander of Photo-Sound Corporation in a selling huddle on board ship with Bert Mason of Bert Mason & Son, Commercial Motion Pictures. Roos is now somewhere in France or Spain.

Retiring President



PRESIDENT JOHN I. CRABTREE of the Society of Motion Picture Engineers, retires this month after holding office for two years. Under Mr. Crabtree's guidance the S.M.P.E. has made very notable strides and has increased its membership at an almost unprecedented rate.

1,000,000 Newsreel Patrons

THE NEWS THEATRE in Shaftesbury Avenue, London, celebrated its first anniversary recently. It is the first news reel theatre that was opened in Europe. Though its capacity is only 500, over one million patrons have passed the box-office; it is stated that there is seldom a vacant seat. It is sponsored by British Movietone News.



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Academy Nominates

THE Nominating Committees of the five branches of the Academy of Motion Picture Arts and Sciences have made their reports to the Secretary of the Academy. The five nominees for the Board of Directors are as follows:

For the Actors Branch—Conrad Nagel

For the Directors Branch—Frank R. Capra

For the Producers Branch—M. C. Levee

For the Technicians Branch—Max Ree

For the Writers Branch—Benjamin Glazer.

These five nominations and the nominations for executive Committees of the Branches were mailed in ballot form to the Academy membership. The election will be held on October 17, the polls closing at 6 p.m. that day. Immediately following that date the new Board of Directors will meet to elect officers for the coming year. The Annual Awards Banquet and Business Meeting of the Academy will be held at the Ambassador Hotel, Tuesday evening, November 10th.

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Cinematographic Annual NOW

In Darkest Africa



From Africa, Martin Johnson, noted traveler and hunter, sends photo of himself with Bell & Howell Professional Camera.

Sugar For Film Base Claim of English Inventor

ARTHUR S. FORD, an English chemical engineer, after more than 40 years of research work and experiment, has succeeded, it is reported, in transforming sugar into a plastic substance from which, it is claimed, non-inflammable film can be produced. Calling his sugar celluloid "sakaloid" the inventor claims he can produce celluloid for all purposes, at very low cost. The raw material used can be either beet or cane sugar in any stage of refinement, or even raw sugar cane; treated in one way, it freezes into a hard, glass-like mass; in another it becomes a transparent substance, with rubber-like qualities; while a third variation of the process converts it into a celluloid. A large American chemical corporation, it is declared, has interested itself in the invention and plans commercial production of the new material within the next few weeks.

British Television

THE FIRST television broadcast from a British Broadcasting Corporation studio has recently taken place. The numbers comprised Swedish folk songs in costume, comedy songs at the piano and dances. The broadcast from No. 10 studio took place of the usual transmission from the Baird studios and was under control of the Baird Company engineers.

Screen Definition

(Continued from Page 12)

For central observation at a given distance the depth effect was remarkably good, but side view distortions again made it impractical for any theatre use.

Reviewing these three groups of screen treatments there is not only a possibility but a strong probability that with a proper understanding of their fundamental optical values, a combination of their in themselves more or less negligible merits would result in rather marked improvements in screen effects.

CONCLUSION

The foregoing analytical studies of the elements governing screen definition were by the physical limitations of this presentation only of a fragmentary nature.

They can be segregated as related to three groups of endeavors, those of

1. The camera designer and cinematographer.
2. The lens designer or manufacturer and
3. The projection machine and screen designer and builder.

These studies show a great number of possible improvements in screen presentation, all of them a help in more closely approaching natural vision when contemplating nature itself.

Where and whenever advantage has been taken of these facts, the related activities were and are usually decentralized and a cooperation of the above mentioned three groups on a carefully prepared plan of cooperation and proper combination would certainly bring screen results which are now only a hope.



New M-G-M Laboratory

(Continued from Page 14)

departments is maintained at the same temperature and humidity. In this plant, on the contrary, the air of each room is constantly maintained at the temperature and humidity best suited to the particular work being done in that room. The loading and printing rooms, for instance, are maintained at a moderately cool temperature, with sufficient humidity to keep the film flexible, and insure freedom from static. The developing-machine rooms, on the other hand, are maintained at still different degrees of temperature and humidity, while the air supplied the drying cabinets of the developing machines is at a higher temperature than that of the room, and is completely de-humidified. All the air is, of course, washed and filtered, so that it is absolutely clean and positively dust-free. According to Mr. Nickolaus, this air-conditioning plant uses more than one hundred and fifty tons of refrigeration daily, and handles 105,000 cubic feet of air per minute.

From the practical viewpoint, aside from the extreme efficiency of the new plant, a very pleasing feature is that in every department room has been allowed for considerable expansion. Therefore, whether this expansion may be merely in the matter of volume, or in the line of such new developments as color or wide-film, the plant is likely to be adequate for many years to come. This indicates a degree of foresight too seldom found in the plant-building operations of this industry, and is a hopeful forerunner of the type of intelligently efficient operation which is one of the industry's greatest needs. Metro-Goldwyn-Mayer is to be congratulated upon their new plant, and its farsighted chief.



Install German Sound

FIFTY Bauer sound reproduction sets were installed in Belgium as of July 15. This is a German sound-on-film set. It is stated that this is a record number of installations for any single make in Belgium.

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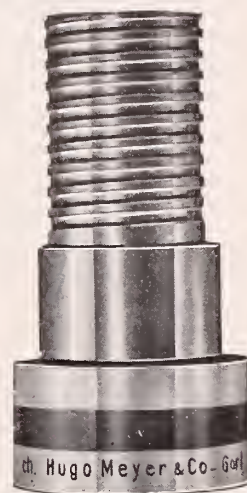
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Thomas A. Edison



THE EYES of the world are centered on the home of Thomas A. Edison, who is fighting a noble battle against an illness that threatens to take him. Mr. Edison is one of the three honorary members of the American Society of Cinematographers, every member of which breathes a silent prayer that the great genius wins his fight.

300,000 Home Projectors Sold in United States

FULLY 300,000 projectors or motion picture machines of the 16 mm. class have been sold in the U. S., exclusive of another 100,000 of smaller type movie machines that are termed toys and also use shorter lengths of 16 mm. films, according to A. D. V. Storey, executive secretary of the 16 MM. Motion Picture Board of Trade. Pictures are now offered on the 16 mm. market by leading producers, including Paramount, Universal, Pathe, Columbia, FitzPatrick and others, says Storey. There are at present more than 1,000 productions in silent 16 mm. film for use on the home or non-theatrical projectors. These pictures are reduced versions of productions previously seen in theatres and include almost all screen favorites. Talking pictures available for the 16 mm. market already total more than 400, ranging from one to seven reels and also including leading stars. About 15,000 radio dealers are arranging to handle 16 mm. talkie machines.

To Open 16mm. Exchanges

OPENING of 150 exchanges throughout the country is planned by International 16 mm. Pictures, Inc., which will release talking film libraries of 14 major producers. George Hoppert, advertising manager of Pacent Electric and Pacent Reproducer, joins the company Monday as vice-president.

Kodacolor Time

AUTUMN is with us again, and in those sections of the country where the frost turns the leaves to all the beautiful colors of the rainbow opportunity presents itself for some beautiful scenes in Kodacolor. The amateur who does not take advantage of the season is missing a lot.

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Navy Uses Pictures for Recruiting

"ANCHORS Aweigh"! The Navy has "shoved off" on a new recruiting venture that is more modern than even Uncle Sam's most up-to-the-minute cruiser.

The potential recruit will no longer question the veracity of the glib tongue of the recruiting officer or the genuineness of the alluring scenes depicted by the Navy Recruiting Poster.

The dubious "prospect" can see and hear for himself the flashing action, the strange beauties, the wondrous sights that are the heritage of the lad who goes to sea.

The anxious parent, whose signature is required to "sign up" a minor, has all of his or her fears expelled by an actual portrayal of life on one of Uncle Sam's "battle wagons". The health-building life, the character-forming discipline and the broadening experience of travel are all convincingly depicted in sound and action on the talking screen.

Each of the 36 Regional Recruiting Offices of the U. S. Navy Recruiting Service has been equipped with an Animatophone Portable Talking Picture Unit.

The Animatophone is a sound-on-disc synchronizer of the type which is proving so popular in sales work and teaching. It uses the 16 mm. (narrow width) non-inflammable film which may be synchronized with either the regulation 16" Movie record or the 12" phonograph record. Its operation is very simple, yet it is said that the quality of the presentation is comparable to that offered by the better theatres.

Some of the Navy films which may now be seen and heard at Recruiting Stations are:

- | | |
|------------------------|-------------------------|
| "Road to Progress" | "Sharks of the Navy" |
| "Progress in the Navy" | "Paths in Palestine" |
| "Great Caesar's Ghost" | "Shanghai Jesters" |
| "Harem Scarem" | "Outposts of Old Glory" |
| "Sailors of the Skies" | "Hello Hawaii" |
| | "Anchors Aweigh" |

New Line of Rectifier Assemblies

A NEW LINE of rectifier assemblies in which is included power packs for operating photo-electric amplifiers, exciter lamps and other devices requiring low voltage, direct current, is announced in the course of development by the B-L Electric Co. of St. Louis.

Army To Build 5 Theaters

Washington—The Army has decided to build five \$20,000 fire-proof theaters, for motion picture programs. They will be located at Fort Niagara, Fort H. G. Wright and Madison Barracks, in New York; Fort Hancock, N. J. and Fort Crook, Neb. Admission price for enlisted men will be 15 cents, civilians 25 cents and children 10 cents.

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Place your order with your dealer, or order direct from this magazine. The price is \$5.00 postage paid.

Returns To China



WILLIAM H. JANSEN, who was elected to membership in the American Society of Cinematographers recently, has returned to Shanghai, China, after spending six months in the States. Mr. Jansen, who heads the Industrial and Educational Films, Inc., of Shanghai, has done remarkable work in China in the cause of the motion picture. For eight years he has made pictures over there and has built up an enviable reputation.



Mole To Convention



PETER MOLE of the firm of Mole-Richardson, Inc., studio lighting equipment makers of Hollywood, has left for an extended trip through the east. He attended the Fall Convention of the Society of Motion Picture Engineers at Swampscott, Mass., and from there plans to spend considerable time in Rochester, Schenectady and New York City, and on the return trip will stop off at Cleveland for conferences with lighting officials and engineers of the General Electric.



John W. Boyle Returns

JOHN W. BOYLE, former president of The American Society of Cinematographers, has returned from Sweden, Norway and Denmark, after several months in those countries. Mr. Boyle, accompanied by Mrs. Boyle and Ray Fernstrom, photographed some 30,000 feet of film while abroad, and Mr. Boyle is busy cutting and assembling it now. In the November issue of this magazine will appear an interesting story by Mr. Boyle of his experiences abroad.

Photo Engravings

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Low Key Lighting

(Continued from Page 15)

until his picture is on the screen and in the best possible form. In his work on the set, he must attempt to foresee every possible thing that can affect the quality of his picture between the time that it leaves his camera and the time that it reaches the screen, and inasmuch as may be possible, counteract it in advance. Motion picture photography is at best a complicated process, but when it is complicated by the unknown factor of today's variable photographic quality of release-prints, it is doubly difficult. It is hard enough, heaven knows, in these days of forced-draught production, to turn out photography that combines originality and that elusive thing known as "quality," but when one is trying to do this without any knowledge of the way that quality will be transmitted to the finished release print, it becomes all but impossible to do the best work. The freelance cameraman soon finds out the qualities and characteristics of the laboratory service of the different studios, and he is invariably happiest—and working at his best—in those whose laboratory service, whether maintained by the company or done by an outside firm, is such as assures him of a definite, standard quality in his release prints. Thus, for the good of the industry as a whole, whose success so greatly depends on photography, it is to be hoped that the photographic quality of release prints will soon become as standardized as is their physical form already. When that day comes, although it will be putting the whole question of photographic quality squarely up to the cameraman himself, I am confident that not only will our photography be better, but that our work on the set will be far more efficient.



Amplion Corp. Markets New Reproducing Unit

DEVELOPMENT of a new reproducing unit marketed under the trade name of "Octophase" has been announced by Amplion Products Corp., of New York City.

Efficiency of the unit, it is said, is from six to eight hundred per cent greater than that of cone speakers and its output volume so high it exceeds that of the average speaker by an amount equivalent to that obtained by the use of an extra stage of amplification. Not only may greater volume be obtained with lower amplification output, with the use of this unit, but due to the wide frequency range of reproduction, clearness and naturalness of tone, greater intelligibility of speech is realized at lower volumes, the company declares.



Ufa Efforts

A JOINT push to attract new talent to the cinema is being made by Tobis and Ufa. A sum of 100,000 marks has been set aside for the campaign. Of this 10,000 marks will be spent in finding artists and screen talent. Prizes are being offered for scenarios and ideas. If one of the selected manuscripts is used for a film 3,000 marks will be paid to its author. If it is used only for a short the author will receive 1,000 marks.

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will bring you splendid results. Our readers represent buying power. No waste circulation.

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Sound Problems—And Their Solution

by Robert Lothar Kendall

President, Kendall & Dasseville, Inc., New York

THE ULTIMATE solution of the motion picture industry's sound difficulties would seem to lie in the building of a higher standard, especially in its great and only partially prepared outlet, the world's theatres, by creating there mechanically and electrically perfect equipment, capable of reproducing its product in absolute minute detail.

Producers have learned to bring forth the best efforts of the acting profession, the director, the cinematographer and the sound technician. They have provided them with all the necessary facilities and equipment for doing so. Thus, the finished product reaches the exhibitor in cans all ready to serve his patrons.

Likewise, the exhibitor has provided himself with the best reproducing equipment available. But, what is the result? The exhibitor may be personally satisfied—the same, however, cannot be said of his patrons.

After all, dialogue motion pictures are nothing more than light and shadows projected upon a screen with which sound has been combined—in other words, an illusion. It is the exhibitor's duty to make this illusion as near perfect and life-like as possible. Just what efforts does he expend toward this end? In most instances he does exactly nothing!

Luckily, the industry is composed of a sufficient number of far-sighted theatre men who conscientiously strive toward the ultimate goal—perfect dialogue motion pictures, and it is that particular group one feels most in sympathy with.

An exhibitor's sound problems are manifold. Probably the greatest among his problems is, dat ol' debil, ACOUSTICS.

Millions of dollars have already been spent upon "cures" with only indifferent results. All sorts of products are offered. Let us name only a few of them: "Padding", tile, blocks, discs, plaster, drapes, carpets, seats . . . ad infinitum; any one or a combination of which, naturally amount to a considerable investment of the exhibitor's part, with no assurance that his sound will actually be to his entire satisfaction.

It really does seem silly to change an auditorium to suit the sound, when the sound can be easily corrected to suit the auditorium. Does it not?

Sound research has now progressed sufficiently to study its characteristics under certain given circumstances and it has been proven conclusively that no existing theatre auditorium need be treated in any form to enable true and life-like reproduction of dialogue motion pictures. Neither need an auditorium be entirely filled with sound volume to bring about the correct optimum time of sound, or to reach extreme side seats. A lot of other carefully adhered to fallacies have also been exploded within the last eighteen months.

Filmo Topics

BELOW are listed some of the features to be found in the October issue of Filmo Topics, the excellent magazine which Bell & Howell Co. publishes and sends free to amateurs. Just write for a copy to the Bell & Howell Co., 1848 Larchmont Ave., Chicago, and it will be mailed to you.

Titling Your Films. No. 10. A seasonable review of the preceding articles of this series.

Splicing Is Easy—Try It! How to splice 16 mm. film explained with five diagrams and a few words.

Let's Ape Our Big Brothers. Yes, the cine-amateur, like his Filmo, has a Big Brother to look up to.

Autumn Filming. October's cinematic offerings and how to do them justice with your Filmo.

Classified Advertising

Rates: Four cents a word. Minimum charge, one dollar per insertion.

WANTED—MOTION PICTURE CAMERAS

WANTED—For cash, DeBrie, Pathe, Bell & Howell Standard cameras. Send full description. Bass Camera Company, 179 West Madison Street, Chicago.

FOR SALE—CAMERAS

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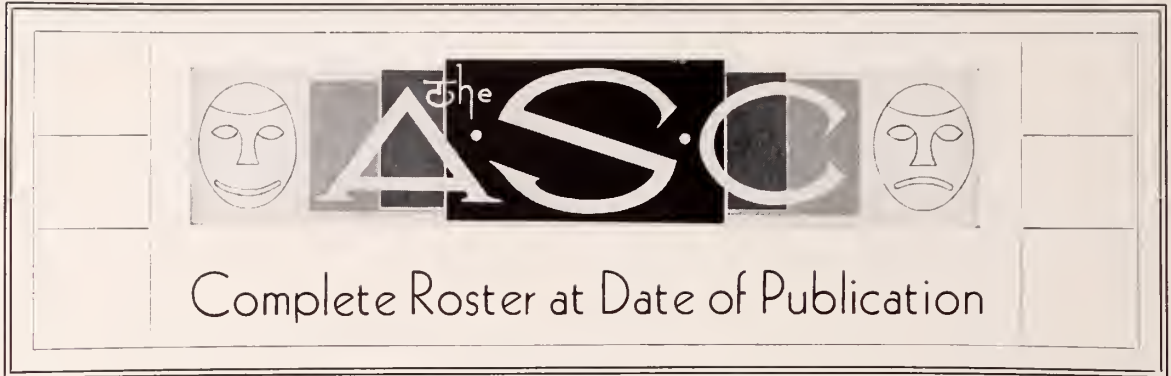
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They even began to tell Jimmie to go out and get some experience—they were making talkies today—he was from the silent days. The thing began to work on him, made him think he must go out and get that experience, but where? He did a quickie or two that could not stand the price of proper lightings, but his work stood out. Even with this "experience" the big studio gates were still closed.

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Volume XII

NOVEMBER, 1931

Number 7

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NEW YORK, TUESDAY, SEPTEMBER 29, 1931

64 PAGES

Riders of Purple Sage

Fox production and release. Features George O'Brien, Marguerite Churchill and Noah Beery underlined. Based on Zane Grey's novel of same name. Directed by Hamilton MacFadden. Photography, Geo. Schneiderman; sound, Eugene Grossman. At the Roxy, N. Y., week Sept. 25. Running time, 58 min.

Lassiter	George O'Brien
Jane Withersteen.....	Marguerite Churchill
Judge Dyer.....	Noah Beery
Bess	Yvonne Pelletier
Venters	James Todd
Oldring	Stanley Fields
Fay	Shirley Nail

This Zane Grey milestone is still a good western. Hardly for the deluxe houses, but the Roxy is dressing it up by giving it a wide screen all the way. For the B and C houses and all spots behind those classes this veteran of screen stories will make good.

As far as Fox is concerned George O'Brien is Jim Lassiter, III, even though it's the first time the character has had his voice amplified for an audience. Back in '18 this company adapted the Grey tale and spotted William Farnum in it. Seven years later Fox tried it again with Tom Mix. Approximately another seven years and now O'Brien for the story's debut in sound. Those seven-year lapses represent cycles in Hollywood, the studios generally figuring it suicide to remake a picture in any time less than that. Anyway, this certainly makes Lassiter the Peter Pan of the horse operas.

Here the story gets dialog for the first time and that seems one of its troubles. Every so often the conversation has a little tinge and still of Arizona in the middle of the nineteenth century. But George Schneiderman's lens ability plus a tot named Shirley Nails go a long way to overcome the inept talk. The photography, incidentally, is probably the main reason the Roxy decided upon the big screen. Any number of times during the screening it's obvious that Schneiderman's glass and the wide angle projection lens are tossing bouquets at each other as there are many instances in which one enhances the other.

If the story needs recounting and it probably doesn't, the principal conjecture is that it was a happy day for fisherman Grey when he penned

'Riders.' It marked the first time he hit the best seller class and Fox has presumably determined to keep it alive forever.

O'Brien interprets Lassiter as of the familiar strong and silent type. It's a likeable performance by the featured player whose dexterity with a gun is noteworthy here. Marguerite Churchill is often in the embarrassing predicament of long and theatric speeches which won't help her impression in the better houses if Fox intends to send it through these spots embellished by enlarged projection. Noah Beery is in and out briefly as the much discussed but little seen menace.

McFadden's direction has apparently closely followed the trail of predecessors. No unusual high or low lights although the dramatic backing up of a stampede by Lassiter has been muffed for audience effect through a climaxing avalanche has been well cameraed. For those who have forgotten the tale, perhaps a reminder that this avalanche saves Lassiter and the girl to eventually spend the rest of their lives in Surprise Valley will recall the yarn which ends when Lassiter pushes over the balancing rock to choke of the pursuers and at the same time close their own one means of escape. Director's best contribution to all this is a workmanlike simulation of a secret mountain passage having its entrance masked by a waterfall.

The Roxy matinee audience took it all good humoredly and found only occasion to snicker over the situation where the girl gives Lassiter back his gun after berating his killer instinct. The picture doesn't look expensive and for that reason, in addition to its scenic beauty and action, it should finally come up as a refutation of the 'they can't come back' theory. It is entirely devoid of comedy other than for the antics of the diminutive Miss Niles.

Fox ads for the Roxy showing ran in the dailies without mentioning a cast name, and on the introductory screen wording the author is above the film's title. Lack of drawing power among the players is a handicap for the picture which won't figure so much for the subsequent runs.

Sid.

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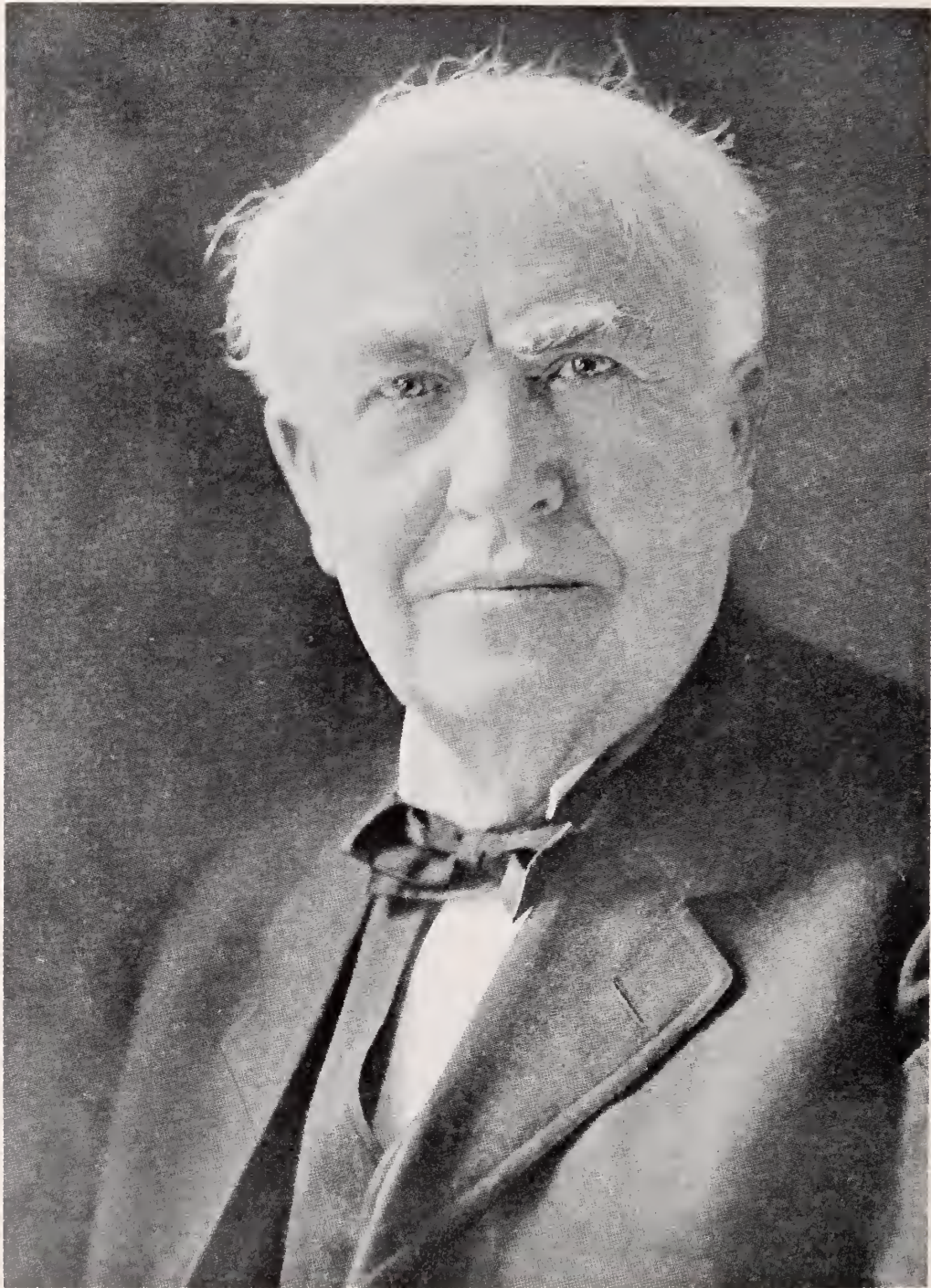
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Making Miniatures

by **DON JAHRAUS**

Head of Miniature Department, RKO Studios.

MINIATURES have a twofold purpose in motion picture production. They are used primarily to accomplish certain action which would be impossible or impractical in actuality. They are also used to establish backgrounds, and to provide settings which would otherwise be too elaborate for normal reproduction. In neither case are they intended, as some laymen mistakenly claim, to fool or defraud the public. On the contrary, they are intended to benefit the public by giving them better, more convincing pictures at lower cost in money and frequently in human life. Miniatures, in fact, are quite as legitimate a part of production as are full-scale sets.

The making of these miniature sets has become a highly specialized art. It is usually carried on by a separate and entirely self-contained department, the head of which works in extremely close contact with the supervising art-director of the studio and with the special photography or trick-camera department whose personnel do the work of photographing the completed miniature sets. Miniature making demands a unique combination of technical and artistic attainments. Success depends upon a happy combination of photographic, artistic, and mechanical effects, and since all of these factors enter into the design of every miniature, the miniature technician must have an intensive

first-hand understanding of all three. He must be sufficiently an artist to make his miniatures harmonize with the full-scale settings of the picture, sufficiently a photographer to be able to design his miniatures for the camera, and sufficiently an engineer to be able to design efficient, workable miniature properties.

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An excellent example of a modern miniature—hills, streams, train—believe it or not.



Another example of what is done in the Miniature Department.

quired in order to avoid grossness, which destroys the illusion of reality that is the distinctive difference between a good miniature prop and commonplace models and toys. Although this minute detail is rarely so apparent in the completed shot as to be consciously noticeable to the audience, it is none the less important, for if it is missing the audience speedily becomes conscious of it, and resentful of the fact that it is looking at a miniature. For this reason, the ordinary models available throughout the country from model shops or individual, amateur model-makers, are seldom, if ever, of any value for use in miniature sets, while, of course, toy automobiles, airplanes, railroad trains, etc., are naturally worse than useless. Furthermore, such miniature properties must be conceived and executed in a definite relationship with the miniature set upon which they are to be used. Unless both the miniature prop and its accompanying set are perfectly coordinated, the illusion of reality is lost, and the shot will be worthless.

The importance of proper painting cannot be over-emphasized. Scale and distance—the illusion of actuality, in fact—depend largely upon this operation. Contrast must be eliminated in the foreground and accentuated in the background to aid in conveying the impression of natural atmospheric distances. The cinematographer, too, by the discerning use of such devices as gauzes, glasses, and lighting effects plays a large part in creating this illusion. The use of natural backgrounds and filtered skies add immeasurably to the scenic values of the shot, as well.

The miniature technician must be familiar with the use of an endless variety of materials and trades. Among these are carpentry, pattern-making, carving, sheet-metal work, casting in both metal and plaster, plastering, machine-work, electrical design and construction, mechanical engineering, and painting. He must be a particular type of landscape-gardener, with an intensive knowledge of the various shrubs and plants adaptable to his peculiar needs. He must know something of practical geology. He must be enough of a modeller to reproduce in form and texture the various natural formations. He must be enough of an artist and photographer to see that his work is not only properly painted, but painted so as to secure the desired photographic effects. He must be ingenious enough to devise mechanical methods of obtaining the action required—no matter what that may be. He must, in a word, be able not only to make models that look right, but models that will work. This is a broad field indeed, and experience is the only teacher. Furthermore, experience can teach only the basic processes, for each new miniature is a separate problem, requiring individual and distinctive treatment, differing in detail from all other miniatures.

The miniature technician cannot, however, bring his shot to the screen single-handed. His efforts must be united with those of the cinematographer in order to add the set and its action to the picture. Like the miniature-maker, the camera-



A modern miniature train wreck

man must be a specialist, for he, too, is dealing with a highly individualized problem, in which experience is his most valuable asset. Only experience can teach him the type of treatment and equipment required. Therefore, while there are many expert cinematographers who are capable of photographing full-scale action on normal sets, there are only a few really competent miniature-cinematographers. There is a very definite, though elusive, relation between the size and scale of the miniature and the photographic treatment it requires. Lighting a miniature set is entirely different from lighting a normal, full-size one. The scale of the miniature and the speed of the camera must correspond exactly, while different types of action require different taking-speeds. As a rule, the best results are obtained by the use of super-normal speeds—running in general practice from four to eight times normal. Most important of all is the placement of the camera, for upon this depends much of the success of the shot. Not only is the horizontal angle important, but the height of the camera, as well. This last factor is greatly influenced again by the size and scale of the miniature, as well as by the nature of the action. Frequently a great deal of special treatment is necessary—particularly in the foreground in order to avoid undue softness of focus without sacrifice of the natural detail of the scene, upon which the illusion of actuality depends. A peculiar feature of miniature photography is that, despite this need of detail, the scene must nevertheless be both lighted and photographed softly. The inexperienced cinematographer will almost inevitably photograph his scenes too crisply, which will destroy completely the desired illusion of naturalness, and reveal the scene as patently a miniature. The photographer must, also, be an expert in super-speed cinematography, for the softness increases directly as the speed increases—and he must know how to use this

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Photographing a miniature wreck



An early miniature, with all the earmarks of inexperience

Make-up for Fast Film

by **JAMES BARKER**

Head of Makeup Department, Fox Studios.

IT WAS inevitable that the introduction of the new "Fast Film" should be of almost as much importance to the makeup artist as it was to the cinematographer, for his work is of an almost photographic nature. It demands nearly as much knowledge of photographic technique as does actual camera-work. For the successful makeup artist must know not only the application of grease-paints, liners, rouges, and powders, and their photographic values, but the exact technique of each individual cameraman with whom he works. No branch of moving picture production can be self-sufficient: each must cooperate closely with every other branch, and particularly with the photographic branch, since after all the only reason for anything that goes into a picture is to be photographed.

And if this close cooperation with the cameraman is important to the success of the other production departments, it is absolutely vital to the success of the makeup department. Faulty makeup work will spoil the best photography—and lack of understanding of the methods of the individual cameraman will often turn an otherwise perfect makeup into a bad one. The reason for this is that the success of a makeup depends upon its being accurately suited to the photographic conditions applying on the set. In other words, the makeup must not only suit the subject, but the film used in photographing that subject, the filters used (if any), and most of all the type of lighting used by the cameraman in charge of the picture. We have found through sad experience that we cannot give each player a standard makeup treatment to be used unchangingly: if, for instance John Seitz is photographing a star—say Janet Gaynor—she must wear one type of makeup, while if James Howe, or Arthur Edeson, for instance, were to be assigned to photograph her next picture, she would in each case wear a considerably different makeup. Obviously, the cameraman and makeup man must work together as closely and understandingly as brothers.

For this reason, in my department we have a firmly established practice of having a makeup expert on the set at all times. It is his duty to see that all the players—from the stars to the "bit" people—are always made up properly for the requirements of the particular cinematographer who is in charge. This policy has proven extremely popular with the cameramen, for it frees them of the responsibility of supervising this important but often infinitely troublesome detail, and allows them additional time to concentrate on their primary business of securing the best possible photographic effects. Most first cinematographers can remember the days when, as there were no studio makeup departments, they had to personally check every makeup in the cast, and often fight unceasingly to prevent certain players from experimenting during a picture, and starting the picture with one face and ending it with another. But not only has this policy proven a time and labor saver to the cinematographer, director, and supervisor, but it has also given the makeup department a far better chance to keep in close touch with the preferences and methods of each individual cameraman—and accordingly to be able to suit the makeups more and more perfectly to the photography of each cameraman.

But although makeup cannot be absolutely standardized, experience has shown us that certain basic rules can in most cases be followed.

In the first place, we have learned that the general tone of the makeup must offer a definite degree of contrast with the natural coloring of the player. If a player is a brunette, the

makeup required is not—as one might suppose—a predominantly dark one, but a light one, in order to display the dark hair and eyes to the best advantage. Similarly, a blonde requires a comparatively dark makeup, not only to accentuate her bloneness, but because the cinematographer almost always lights blondes in a higher key than brunettes, using "hotter" back-lighting, and necessarily a higher-keyed front lighting in order to balance things.

Similarly, a cinematographer who works in extremely low key lightings—like Jimmie Howe, for instance—will get the best results if his players are made up in a relatively high key—in other words, if his players wear rather light makeups. This is because the lighter makeups will enable him to use less front light, and, accordingly, a lower key generally.

By the same reasoning, a cinematographer who works in a higher key—like John Seitz—requires darker makeups to balance the greater intensity of light that he plays upon the actors.

In this we have the key to the problem presented by the new film. In effect, the considerable increase in film sensitivity is the same as raising the key of the lighting. The secondary change in the film—its improved color-rendition—while it offered some new problems, proved to be vastly less troublesome than might have been expected.

This is because we have been working with panchromatic emulsions and incandescent lighting long enough to become thoroughly accustomed to its requirements. We had solved the major part of this problem years ago, when the first panchromatic film and Mazda lights so suddenly displaced the old ortho stock and hard lighting. In those days, it will be remembered, the predominant tint in makeup was a reddish yellow, while reddish rouges predominated, and blues, grey-blues, and even greens were used for highlighting. Then came Panchromatic film, with its radically different color-sensitivity. And with it came the soft, yellowish Mazda light. The problem was attacked concertedly by the American Society of Cinematographers and the Motion Picture Makeup Artists Association in the memorable "Mazda Marathon" held at the Roosevelt Hotel and Warner Bros. Studio, and, later, by the A.S.C.'s series of Panchromatic Makeup tests. Out of these evolved the present-day Panchromatic Makeup materials and technique. Essentially these consist of the use of a completely monochromatic makeup, predominately a brownish red throughout. The panchromatic cosmetics developed included a wide range of tones, all of this predominant shade, and so standardized that the recommendation of a given shade of grease-paint automatically indicates the proper accessories—powder, lining-color, rouge, etc.

Generally speaking, for panchromatic film, the average makeup for women would be based on No. 24 grease-paint, and for men on No. 26. With the introduction of the new Super-Sensitive Panchromatic film, however, our experience indicated that, since the increased sensitivity of the film was practically tantamount to a raised key of lighting, the obvious solution would be to go to a darker overall makeup. Just how much darker, however, had to be determined by actual experiment. Moreover, since the Fox Studio was the first to authorize a complete change to Fast Film (it did so within a few days after the announcement of the new type), our time for experimentation was severely limited, as there were several productions being delayed pending our recommendations.

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Above, left—Dyeing homespun wool in Dalecarlia. Right—Mr. Boyle photographing the weavers in the Dalecarlian school. Center—Dalecarlian peasant types. Below—Two views along the famous Cota Canal.

A Cinematographer in Sweden

by JOHN W. BOYLE, A. S. C.

THOU ancient, Thou free, Thou mountain-high Northland,
"Silent, joy-rich and beautiful!"

So sing the Swedes about their country: it was the first song that we heard as we landed in Gothenburg, and the last we heard as we sailed away. Its words express more than any other phrases the memories that we brought with us, together with 30,000 feet of Multicolor film with which we had tried to create a living picture of this little-known country.

When Mrs. Boyle and I, accompanied by Ray Fernstrom, landed in Sweden last June, none of us, except perhaps Ray, who is both a cinematographer and a Swede, had any idea of the possibilities that lay before us. We knew that Sweden was, photographically speaking, virgin territory, and we had been told that it abounded in pictorial material. But we soon enough had proof of it! Immediately we set out from Gothenburg to Stockholm by way of the famous Gota Canal route, and found ourselves surrounded by pictures. Imagine sailing through the heart of Sweden—cruising along in a tidy little white steamer, alternately through narrow waterways leading through parklike forest and farmlands and across broad blue lakes. Imagine climbing hundreds of feet up and down quaint, hand-operated locks a hundred years old, then to sail along between tree-lined banks, while loaded farm-wagons jog along the shore, almost within arm's length of the deck-rail!

After reaching Stockholm, we made that city our base of operations, while we ranged far afield in search of pictures. One very interesting sequence we made in the ancient city of Visby, on the island of Gotland. This city was in its day (from the first century down to the fifteenth or sixteenth) one of the great commercial powers of the world. Its inhabitants were nominally merchant princes—and, when it suited them, pirates as well. Their commerce extended to the four corners of the earth until their city became indecently rich, and finally fell prey to a powerful neighbor-prince. But although this wealth has vanished (save for the ancient coins that one can still find buried) Visby is rich in legends and ruins. It is one of the few walled cities that remain, while within its great wall stand many quaint old-world houses, and the ruins of sixteen churches built in the days of Visby's greatness. Those days were long before the reformation, and, so tradition tells us, each church represents the penance of some merchant-prince for a lapse from the straight and narrow path of commerce into the easier ways of piracy! Be that as it may, the ruins remain, picturesque and beautiful, together with one church built in the thirteenth century and still used. We also found that many of the old medieval costumes were also preserved—and thanks to Ray's persuasive tongue we were able to use them in staging scenes which brought back a clear picture of what this lovely island of ruins and roses must have been in the days of its greatness.

Similarly, when we visited the province of Dalecarlia—or Dalarna, as it is known to the Swedes—we found it a rich storehouse of both the customs and the costumes of the past. Nearly everyone—gentlefolk, burghers, and peasants alike—cherish the traditional costumes of the province, and proudly wear them on Sundays and Holidays. We were fortunate in being there on Midsummer day—the greatest of their holidays. Then everyone in the community turns out, gaily bedecked in the bright costume of his particular parish, to help celebrate the return of summer. Undoubtedly these observances can be traced back to prehistoric, pagan rites: but what is of greater importance to cameramen is the fact that they are today pic-

turesque and colorful scenes. The brightly-clothed, happy people assemble from far and near for the celebration. First they decorate their homes with tree-branches, and shower blossoms on friends and strangers alike. Then come the ceremonies of raising the village maypoles, followed by community dances around them—picturesque folk-dances that last through the long, sunlit night.

In addition to this we were able to revive for our cameras some of the picturesque "church-boats"—great rowboats in which whole villages used to row across Lake Siljan to attend church on Sundays. The boats that we used were more than a hundred years old, and were specially lent to us by the museum where they are preserved. Similarly, through the courtesy of a school of the old arts of spinning, weaving, and lace-making, we were able to picturize these homely crafts that are so rapidly being forgotten by our industrial present.

That is one of the outstanding beauties of Sweden: although it is in every sense a modern, industrial nation, its people still cherish these links with the past. Not only do government and municipal museums have large collections of exhibits showing the home-life and culture of past generations, but so do many individuals. And this, I think, brings to Swedish life a quality that is deplorably lacking from American life: they live more simply, and take time to enjoy life more fully. Even the city-folk live close to nature, for everyone has some sort of a rural retreat in which he spends most of the summer. The rich have beautiful estates; the others at least manage to have their seaside or country cottages—or, if they cannot afford their own, they rent one, or board with some farmer or fisher family for the summer. Business-men spend the week at home in the city, and then on Friday hurry away to enjoy the week-end with their families in the country or at the seashore.

There are many other phases of Swedish life which are of interest to Americans, particularly certain of their progressive industrial and governmental policies. Unfortunately space does not permit me to mention many of them. But I cannot omit two: one is a mine in Dalarna which has been cooperatively worked since the year 1220! It was owned by several great noblemen, who—with amazing foresight for even modern industrialists, to say nothing of men of the thirteenth century—took their workers into partnership with them. How it has enriched the owners may be imagined from the fact that since the middle of the 17th century it has produced half a million tons of copper, fifteen tons of silver, and a ton of gold. It is now the greatest of Sweden's industrial concerns, having expanded in many directions until mining is no longer by any means its chief business.

The second feature is the well-known "Bratt System" of liquor control. By this method liquor is rationed out to the people strictly in accordance with their earning-power and the number of their dependents. A young, single man, with no dependents can get so much "hard liquor" each month: a family man, on the other hand, is allowed proportionately less, or, if his earning power is low, and his family large, none at all; either, however, may have as much light wine and beer as he desires. The result seems eminently satisfactory to all concerned—except to the chronic tipplers, who must go abroad for a really successful blow-out.

While in Stockholm we visited the studios of the Svenska Filmindustri, the leading producer. Although the market for
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A Standard Aperture for Sound Films

by JOHN ARNOLD, A.S.C.

ALTHOUGH the wide-film experiments of a year ago proved themselves only experiments, they have had at least one result of lasting importance in that they focused the attention of the industry on the unsatisfactory conditions existing as a result of the absence of a true standard for sound-film picture apertures. Therefore, although wide film is in itself a forgotten issue, it benefited the industry by starting the researches conducted by the American Society of Cinematographers, the Academy of Motion Picture Arts and Sciences, and by the various producers and manufacturers, which have resulted in the recommendation of a new standard of camera and projection apertures, which are already adopted by some producers, and are expected to soon become an industry-wide standard.

From the earliest days of the moving picture up to the advent of the movietone, the standard frame dimensions were .6795" x .906", giving a rectangular picture with a proportion of 3 x 4. This proportion, although determined and standardized largely by accident, has proven to be the most satisfactory one from both the artistic and psychological viewpoints. It is satisfactory for more than 90% of all possible compositions, and moreover probably the most restful proportion to



The new Movietone aperture

from this chaotic condition, and photography, naturally, more than any other. For even if a studio and the theatres controlled by its owners had standardized on one of these formats, the cameraman was forced to allow for all of the others in his compositions. Otherwise, when his pictures played the smaller houses, or the larger ones controlled by other interests, his scenes would be in danger of misframing—of having heads or feet cut off, or, if a larger aperture was used, of having his carefully planned compositions destroyed by the larger frame. Inevitably the quality of the photography suffered, and with it projection, sound, direction, and all of the other things that depend to any extent upon the work of the cameraman.

At this time, as a strictly temporary measure, the Academy recommended that all vital action be kept within a three by four rectangle marked on the camera ground-glasses, and made so as to suit as nearly as possible the various reduced apertures being used in the theatres. This was very helpful, but

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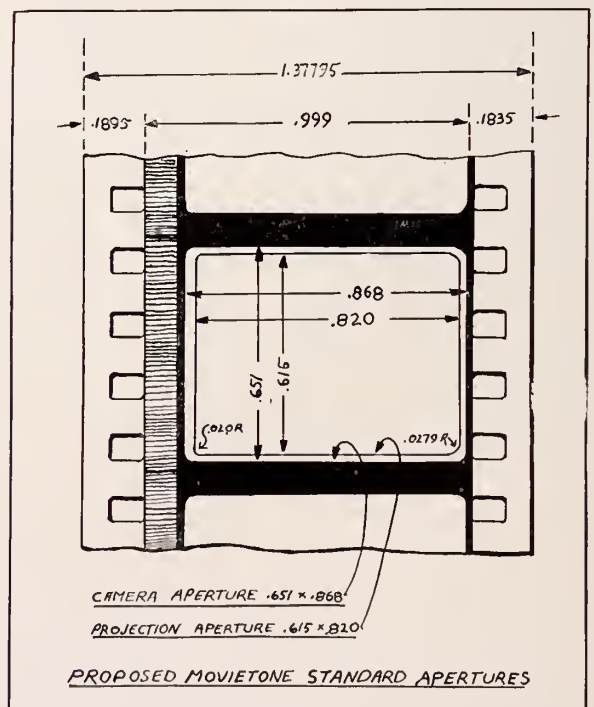


The former silent standard aperture (slightly enlarged)

watch for the length of time necessitated by the average feature picture. In a word, though it may not represent the absolute ideal proportion of the artistic purist, it is sufficiently close thereto to be considered ideal for all practical purposes.

The advent of the talking picture, however, necessitated an alteration of this proportion in order to accommodate the sound track, which arbitrarily sliced .1" from the left-hand side of the picture, leaving a practically square frame. This is an unsatisfactory proportion from every viewpoint. It is an almost impossible frame for the cameraman's efforts at composition, and a most unpleasant proportion for the audience which must concentrate upon it for an hour or more. Such a state of affairs could certainly not be allowed to exist; therefore several theatre-chains and some producers as well, independently adopted reduced apertures which restored the old 3 x 4 rectangle. Unfortunately, however, not all of them did so, while the producers using disc recording, and the theatres equipped only with disc reproducers naturally enough continued to use the old, silent-standard full-frame aperture.

Therefore picture-makers were faced with the necessity for planning their pictures to be suitable to several projection apertures: the old full-frame silent and disc standard, the movietone square, and the several reduced 3 x 4 movietone apertures. Every phase of production and exhibition suffered



Proposed standard apertures

Lens Testing

by **DR. L. M. DIETERICH**

Consulting Engineer

AN EFFICIENT mechanic has not only to be familiar with the tools he is using, but the more expert he is, the more intimate he has to be with all the characteristics and working possibilities of the special tools which he requires for a special "job".

The cinematographer is in a very similar position, with the exception that he has to deal with two groups of "tools"—those of direct influence upon his work, which consist of the optical means at his disposition, and those of indirect influence, which are the emulsion characteristics of the films and the methods and results of their processing.

For the present the optical means only shall be considered or, more specifically, the photographic lenses, as supplied to him by the lens manufacturer.

If we realize that the art and more recent science of lens production are only a few decades old, it becomes truly impressive to observe the unparalleled speed of progressive evolution of this industry and its allied arts and sciences.

This impressiveness changes to admiration when we have the opportunity to study not only the number of intricate problems that have been solved within such a comparatively short period, but become aware of the extreme delicacy of mathematical calculations, of the necessary physical operations and last but not least of the continuously appearing chemical conundrums.

Nevertheless, the era of standardization has by no means been arrived at, especially as far as motion picture camera lenses are concerned and which we are for the purpose of this study solely interested in.

The present state of development brings upon the market and available to the cinematographer a great number of lenses of different characteristics.

There are various standards employed in lens manufacture resulting in characteristics stated by manufacturers as properties of individual lenses with the same terms or nomenclature but very often of different actual values for the same term. As an example, as shown by the comparative research work of Fred Westerberg, the calibrated or stated speed of two lenses of the same focal value, produced by two different manufacturers may be an entirely different speed in actual performance.

The cinematographer, therefore, faces the necessity of conducting a great number of tests and practical observations until he knows the essential characteristics of a new lens. He cannot afford to take such a lens into production work without becoming thoroughly familiar with its actual performance.

In order to eliminate these difficulties, the author has developed a method and commensurate equipment for lens test-

ing by which every lens as acquired could be tested before the same is used by the cameraman.

This method and equipment is beyond the financial reach of the individual cinematographer, is not as scientifically and practically perfect as those used by high grade lens manufac-

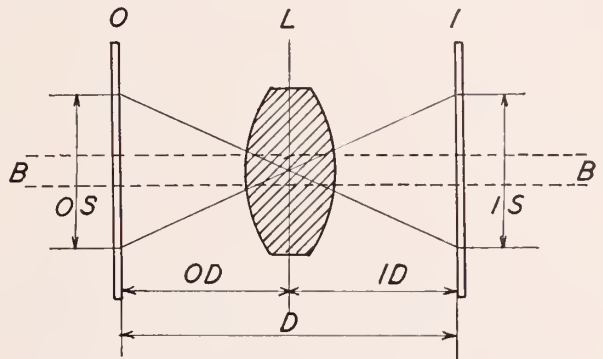


Fig. 2

turers, but will establish and determine such lens characteristics as of importance to the cameraman. It is well within the budget of a studio and of an investment and operating expense manyfold compensated, not only by increased average pictorial values of the produced pictures, but by an actual great saving in time and expense.

The following schematic presentation of methods and equipment deals point for point with such lens characteristics the cinematographer should reliably be informed about.

OBJECT OF TEST . . . FOCUS

METHOD OF PROCEDURE

1. Mount in succession on optical bench B. B. Fig. 1, adjustable mirror, M, sunlight filter, F, test lens, L, and ground glass, G. Move G to sharp sun image and measure background, BF.

2. Mount square ruled ground glass plate, O, in front of test lens, L, Fig. 2, and identical square ruled ground glass plate, I, in rear of L. Use unit magnification by focussing selected objective, OS, to become image IS on I. When ruled pattern on

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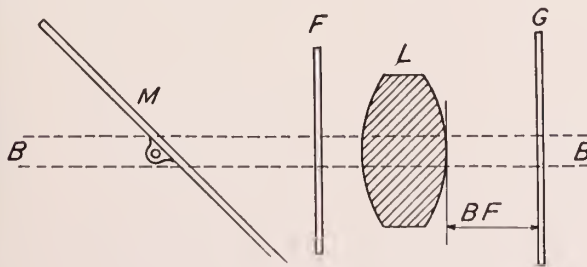


Fig. 1

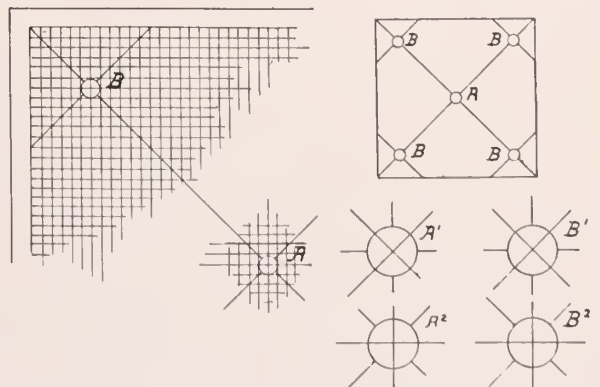


Fig. 3

Photographed by . . .

by HAL HALL

● **THE CAMERAMAN** is a good deal like the engineer who builds the foundation of a skyscraper: the rest of the edifice is built upon what he accomplishes; if he is successful, the very nature of his work draws attention away from itself—but if he makes the least mistake, it is painfully obvious. Wherefore it is only natural that our busy confreres, the screen and dramatic critics of the non-technical press, frequently overlook photography in writing their reviews.

But such is not, fortunately, always the case. There are reviewers—more and more of them, as time goes on—who consciously realize the importance of photography, who appreciate the magnitude of the photographer's contribution to a production, and who accordingly give photography its meed of space in their reviews along with acting, direction, story, and so on. The reviews of these writers are always welcome reading matter to a cameraman, even when he sees his work criticized adversely. They restore his confidence in himself and spur him on to greater efforts, for they are tangible proof that after all he is not photographing pictures artistically merely to please himself, but to please a great public that really wants well-photographed pictures. Of course he is most appreciative of the reviews that praise his work—who isn't?—but even those that do not are welcome, if they criticize it honestly and constructively. And when they single out his work for the superlative praise occasionally accorded exceptional performances of actor, director or scenarist, even the least emotional cameraman feels a new thrill of enthusiasm for his work.

Such a comment recently appeared in *Variety*. To be specific, it appeared in *Variety's* issue of September 29, 1931, under the signature of "Sid" himself. It was in a review of Fox Films' production of "Riders of the Purple Sage," which was photographed by George Schneidermann, A.S.C. When reviewed, this picture, although produced purely as a programme feature, was playing at the famous "Roxy" theatre in New York; an honor for which, in "Sid's" opinion, the photography was largely responsible. Many of the other reviewers who saw the film there may have thought so too—but "Sid" characteristically said so in no uncertain terms. Unfortunately, the space available does not permit us to reprint "Sid's" review in full, but in part it read as follows:

"This Zane Grey milestone is still a good western. Hardly for the de Luxe houses, but the Roxy is dressing it up by giving it a wide screen all the way. . . . As far as Fox is concerned, George O'Brien is Jim Lassiter, 3rd, even though it's the first time the character has had his voice amplified for an audience. Back in '18 this company adapted the Zane Grey tale and spotted William Farnum in it. Seven years later Fox tried it again with Tom Mix. Approximately another seven years and now O'Brien for the story's debut in sound. Those seven year lapses represent cycles in Hollywood, the studios generally figuring it suicide to remake a picture in any time less than that. Anyway, this cer-

tainly makes Lassiter the "Peter Pan" of the horse operas.

"Here the story gets dialogue for the first time, and that seems to be one of its troubles. Every so often the conversation becomes a little formal and stilted for Arizona in the middle of the nineteenth century. **But George Schneidermann's lens ability plus a tot named Shirley Nails go a long way to overcome the inept talk. The photography, incidentally, is probably the main reason the Roxy decided upon the big screen. Any number of times during the screening it's obvious that Schneidermann's glass and the wide-angle projection lens are tossing bouquets at each other, as there are many instances when one enhances the other.**"

Thanks, "Sid." The American Society of Cinematographers is deeply appreciative of this tribute to one of its members. When you, or any of your busy fellow-critics, pays a cameraman such a tribute as that, you compliment every cameraman, for it is the aim of every cameraman to so execute his work that it reflects credit not solely upon himself, but upon his profession, as well. For the good of the profession, he works long hours at the studio or on location, making the best of every adverse condition, and often enduring hardship and even physical peril. More than that, outside of his regular working hours—when most of the other members of the company are enjoying sleep or needed recreation—the cameraman is putting in at his own expense long and arduous hours of study and research to the end that his work shall further enhance that of his fellows, the actors, director, and writer. To gain this end, the cameraman is ceaselessly experimenting with new apparatus—learning the intricacies of every new type of film or equipment—devising new methods and often new machinery—foregoing much of the ordinary pleasure of living, just that the photography of each successive production shall be better than its predecessors. He is not required to do this: the public seldom knows of it; his employers do not pay him any more for it—still he does it. **He is a cameraman.**

Therefore, when one member of the camera fraternity is singled out for such praise, it encourages not him alone, but also every one of his fellows. Every one of the scores of the "men behind the cameras" feels a revived desire to make each scene perfect; not that his camerawork may "steal the picture," but that it may advance the art of photography; that it may make the picture as a whole better. For although the goal of cinematography is purely to make good pictures perfect, and bad ones good, regardless of the credit that may accrue to the individual cameraman, the honest recognition of the critics—who are really the voice of the audience—is the highest reward that any artist can desire. Such recognition of the individual is also recognition of his fellows, and spurs them to new efforts to individually and collectively merit that praise. Knowing definitely that the public appreciates his work, what can a man do but strive even more earnestly to give them the best that is in him?

Color Photography in the Arctic

by **GLENN R. KERSHNER, A. S. C.**

Chief Cinematographer, MacMillan Arctic Expedition.

AT FIRST thought, the Arctic regions would seem the last likely place for color photography to prove valuable, for both natural and man-made coloration are at a minimum there, and the entire region is subject to almost continual fogs. What good, therefore, is a color-process when there are no brilliant colors for it to record?

In actual fact, however, it is exactly these unfavorable conditions that make natural-color cinematography invaluable to the Arctic explorer. Under the prevailing atmospheric conditions which I found in Labrador, I am convinced that either for commercial or scientific purposes, the records made by natural-color photography are infinitely superior to those made by the conventional black-and-white processes. In a region where a majority of the landscapes are composed of snow, dull grey sea, icebergs, and varying amounts of fog, no possible manipulation of film, filters, exposure, and laboratory handling can yield a satisfactorily defined monochrome picture. On the other hand, color cinematography will take advantage of every slightest chromatic difference between sea, sky, snow, and fog. The result is frequently pictorial, and always far more easily understandable to either the layman or the scientist.

I base my opinion upon the experience gained as Chief Cinematographer for Commander Donald B. MacMillan's 1931 Arctic Expedition. In that capacity I photographed more than 20,000 feet of Multicolor, and a considerable amount of black-and-white, as well. Both were photographed largely under the uniformly unfavorable conditions outlined above—at times, even, in worse ones, with snow, rain, or hail falling. In every case, the color films produced by far the best results.

The chief difficulties encountered in Arctic cinematography, aside from the general lack of coloration in the subjects, are the weather, and the difficult working conditions naturally incident to the climate and the limited amount of equipment that can be carried. The weather is, of course, the greatest stumbling-block. Upon referring to my diary, I find that we enjoyed scarcely a week of 100% photographic weather throughout the whole summer. As a rule, an hour or so of sunshine scattered through three or four days was the best that we could hope for. Obviously, since the expedition's work had to go on, we had to photograph many scenes under conditions that would be considered impossible here in Hollywood. That a larger part of the resulting negative was not only printable, but entirely satisfactory I regard as a tribute to the excellence of the color system used, and to its adaptability to Arctic conditions rather than to any personal achievement.

A great deal of the work was done from the air. The expedition was equipped with a speedy Lockheed seaplane which was piloted by Lt. Charles Rocheville, U.S.N.R., one of the most capable pilots with whom I have ever flown. I can never pay high enough tribute to the skill which he exhibited in flying us for thousands of miles through unbelievably bad weather and over uncharted and dangerous areas. Perhaps the greatest praise I can give him is to cite the fact that on every flight—no matter how perilous—he always brought us back to our base safely and with our objective accomplished.

A very important part of my work consisted of making a complete film record of the daily lives of the Eskimos. Having previously filmed almost every tribe of American Indians, I found this a fascinating task. The Eskimo of today still lives the primitive life of the days before the coming of the white man. He has to! No other mode of life is so well adapted to

his surroundings. Save for medical aid, the white man has very little to give the Eskimo; while, on the contrary, if he is going to live in the Eskimo's country, he can learn a great deal from the native. The history of Arctic exploration is full of tales of white expeditions which starved to death in the midst of plenty—simply because they knew too little of the Eskimo's ways of wresting a living from the land.

It was my task to chronicle, as completely as possible, the Eskimo's ways of living. Having worked with primitive people before, I knew that success in my efforts must depend upon first winning the complete confidence of my subjects. In this I was aided immeasurably by being a member of Commander MacMillan's party, for MacMillan is known and loved by every Eskimo. He has studied them and their needs for years, and



Mr. Kershner and Commander MacMillan at the start of the Expedition.

he knows how to aid them without robbing them of their natural independence. With this introduction, I found it easy to win their confidence and cooperation. My first step was always to appeal to their sense of humor. My previous experience with Indians had shown me the fallacy of the general conception of the Indian as a dour and unsmiling person: quite the reverse, for once you have gained his confidence, you find that the Indian has a very pronounced sense of humor. The same is true of the Eskimo, if anything, to a greater degree, for they are a cheerful, happy-go-lucky race of grown-up children, always willing to laugh today, and to postpone worry until tomorrow. So in making my pictures of Eskimo life I would begin by making them laugh. In this part of the work, my guitar and mouth-harp were quite as valuable as my camera. Once they had paved the way, the whole community would be eager to help me film their work, their play, and their homes. And, speaking of their homes, I was greatly surprised to find that the Eskimo seldom use the snow-block igloos in which we picture them, but rather large skin-walled lodges stretched over frameworks of bone or wood, and called **Tupiks**.

The hand-crafts of these people are surprising, both in the manufacture of their weapons and their clothing. The way that the women sew the heavy skins, chewing each seam until the hide is sufficiently pliable for them to make their tiny stitches with caribu-sinew and crude bone needles, always

(Continued on Page 24)

HAL HALL

says



11 Years of Progress

JUST ELEVEN years ago this month the first issue of the American Cinematographer made its appearance. Just a little, four-page paper, telling the news and latest developments in the cameraman's field. A little paper that was established to further the best interests of camera-work and cameramen, and published by the American Society of Cinematographers.

No one even dreamed then that this little paper would some day develop into the world's leading magazine dealing with motion picture photography and all of the allied technical phases of the motion picture industry; that it would become an outstanding publication for thousands of home movie-makers. In fact, no one then dreamed that the business of home movie making would become such a tremendous industry as it has.

Gradually, this little paper made its influence felt, and the natural result was that it changed from a paper issued twice-a-month to a magazine that in time became an authority in its line throughout the entire world. And that is just what the American Cinematographer has done. Backed by the members of the American Society of Cinematographers, this magazine has been a constant source of help to thousands, and has done its part in the development of the technical side of the industry, not only along photographic lines, but in other branches, as well. Its aim has always been advancement, and it has helped the advancement of photography throughout the years.

It has kept step with technical progress, as, for example, its part in the spreading of technical information regarding sound at a time when sound was in its infancy and sources of information on this subject were decidedly limited. Sound being closely allied with photography, it was a natural step to take. But there have been many who did not take the step.

The same was done in the realm of the amateur motion picture maker. When this art began to develop this magazine turned to the business of trying to help the amateur. We feel it has done much in this line, giving information that could be found in no other publication because of the background and experience of the men of this organization.

And now as the magazine starts its twelfth year of service, it starts it with a move for the amateur that is outstanding. Throughout the world there are hundreds of individuals and clubs that are working ceaselessly to create pictures, made by amateurs, that are of real worth. This magazine is now going to give these amateurs an opportunity to secure not only financial regard for their efforts, but International recognition, as well. It has announced a contest for the amateurs in which a thousand dollars in prizes will be awarded and the makers of the pictures will be made known throughout the world.

Surely, this magazine has established a record that its sponsors, the American Society of Cinematographers, may well be proud of. And it is the hope of all connected with it, that during the years to come the American Cinematographer may continue to go forward spreading helpful information and instruction to all who are interested in the photographic art, and those other technical activities so closely allied to the business of motion picture photography.

Our New Cover

WITH this issue of the American Cinematographer we introduce a new type of cover to our readers, and sincerely hope that it will be as pleasing to you as it is to us of the staff.

For some time we have been of the opinion that the type cover we have used for the past two years is not the right kind for a magazine of the type of the American Cinematographer. While these covers have been attractive they gave an air of the "fan" magazine to the outside of the publication. With the new cover we feel that we have something that will appeal to the reader and that will catch the eye of those who are interested in the type of content which we have in our magazine. We intend to retain this cover for some time, and hope that you will never fail to see it stand out among the other publications on the news stands and in the photographic supply dealer's store.

Our Prize Photographs

ON THE opposite page, and the two following pages, appear four photographs that have been entered by our readers in the photographic competition conducted by this magazine. This competition started with the October number. All pictures appearing in the pictorial section of the magazine from October, 1931, up to and including the issue of September, 1932, will be entered in this competition. A cash prize of \$100.00 will be awarded for the best picture; the second award will be \$50.00 and the third award will be \$25.00. The selection of the winners to be made by a special board of judges appointed by this magazine.

This competition is open to all subscribers to this magazine, either professionals or amateurs. The only condition is that no person may enter a photograph unless he, or she, is a bona fide subscriber. If you are not a subscriber and wish to enter photographs, just send in your subscription for a year with your photographs.

The photographs this month were entered by Nicola Buzzo, an amateur, of Blue Field, West Virginia, and Frank Tanner, a professional, of Hollywood. This is a splendid opportunity for photographers to place their work before the eyes of the people in the motion picture studios, and wise photographers should not miss the opportunity. No "snapshots" will be considered. All pictures should be well mounted on not less than 8 by 10 paper.

That Christmas Present

CHRISTMAS is still quite some time away, but it will soon come sneaking in on us, and it seems that now would be a good time to start thinking about the Christmas gifts we intend to make. With that thought in mind, may I suggest that to the amateur or professional one of the finest and most reasonably priced presents you can give will be a copy of the Cinematographic Annual. Volume 2 will be available for your Christmas shopping, and it will solve a lot of your problems. Why not plan to give several of them this Christmas?

Incidentally, anything photographic will be greatly appreciated by the amateur or professional photographer or cinematographer, so just keep photographic minded when you are selecting your presents. Read the advertisements in this journal carefully and we bet you will make some friends happy if you select some of the things advertised here as Christmas gifts. Make this a photographic Christmas.



Dawn

Nicola Buzzo



Arteries

Nicola Buzzo



Little Captive

Frank Tanner



Shattered Dreams

Frank Tanner

S. M. P. E. Fall Meeting

A. N. Goldsmith Elected President

DR. ALFRED N. GOLDSMITH, Vice-president and General Engineer of the Radio Corporation of America, was elected President of the Society of Motion Picture Engineers at the Annual Fall meeting of the society, held last month at Swampscott, Massachusetts. He succeeds John I. Crabtree of the Eastman Kodak Laboratories, who has held the position for the past two years, and much general satisfaction was expressed over the selection.

Other officers chosen were: E. I. Sponable, Vice-president; J. H. Kurlander of Westinghouse, Secretary; Herford T. Cowling of Eastman Kodak, Treasurer.

Attendance at the Fall meeting was even larger than at the Spring meeting held in Hollywood, and there was a certain air of enthusiasm that bodes well for the continued advancement of the S.M.P.E. One of the outstanding features of the meeting was the apparent desire on the part of all to bring the laboratory much closer to the practical business of creating more appealing entertainment. Very definite suggestions made by the retiring president were apparently motivated by this spirit, and they were subsequently reechoed by the newly elected president. Declaring that his visits to studios showed him that reproduction in the theatre has not kept pace with recording, Mr. Crabtree cited three reasons—deficiencies in maintenance of equipment, poor release prints and imperfect projection.

"The motion picture today", said Mr. Crabtree, "is also too much of a machine. More atmosphere and glamour could be created by individuality in the technical presentation of the picture." He then suggested that color be the next major field of development for the motion picture.

There were many unusual papers and demonstrations at the meeting, but standing far above all else was the marvelous advancement in disc recording shown by the demonstration of the Bell Telephone Laboratories. This demonstration of recording on disc challenges the present ascendancy of sound-on-film, and even suggests a return to the original sound method. The technicians have gone back to Edison's vertical method of recording, as he used on his records; and showed the convention something in the way of results that sent every member home talking about it.

This paper described recent progress which has been made in laboratory studies of mechanical records of sound cut on a wax disc. Both theoretical and experimental investigations indicate that a phonograph record cut with vertical undulations instead of the more usual lateral undulations possesses fundamental advantages. The principal improvement comes from a marked increase in the volume and frequency range over which faithful reproduction may be obtained. A higher volume level can be recorded for the same groove spacing and speed. More playing time can be provided with a given size record and volume level since, for these conditions, both the groove spacing and speed may be reduced. Improvements in methods of processing the stampers and in the record material give a large reduction in surface noise and hence a corresponding increase in the volume range. With these improvements the frequency range which can be satisfactorily reproduced can be extended nearly an octave to 8,000 to 10,000 cycles. Other improvements incidental to the improvements noted above are, great improvement in the quality of reproduction obtainable directly from a soft "wax" record and a great extension in the life of the hard record.

Another interesting feature of the meeting was the emphasis that was placed upon the 16 millimeter field. No less than

four very unusual papers were presented, and interest was high in this line.

Following is a list of the entire list of papers that were read before the society:

"Air Conditioning by the Silica Gel Method," by E. C. Holden, Silica Gel Corp., Baltimore, Md.

"Utilization of Desirable Seating Areas in Relation to Screen Shapes and Sizes and Theater Floor Inclinations," by Ben Schlanger, New York, N. Y.

"Design and Construction of Motion Picture Sets," by William Saulter, Paramount Publix Corp., Astoria, New York, N. Y.

"Some Recent Educational Film Experiments," by Glenn Griswold, Fox Film Corp., New York, N. Y.

"The Optics of Projectors for 16 mm. Film," by A. A. Cook, Bausch & Lomb Optical Co., Rochester, N. Y.

"Mechanical Advantages of the Optical Intermittent Projector," by J. L. Spence, Akeley Camera, Inc., New York, N. Y.

"A Sound Motion Picture Projector for 16 mm. Film," by R. A. Miller and H. Pfannenstiehl, Bell Telephone Laboratories, New York, N. Y.

"Advantages of 16 mm. Supersensitive Panchromatic Film in Making Medical Motion Pictures," by R. P. Schwartz, University of Rochester, Rochester, N. Y., and H. G. Tuttle, Eastman Kodak Co., Rochester, N. Y.

"Proposed Standards for 16 mm. Sound on Film Dimensions," by R. P. May, RCA Victor Co., Camden, N. J.

"Proposed Changes in the Present Standard 35 mm. Film Perforation," by A. S. Howell and J. A. Dubray, Bell and Howell Co., Chicago, Ill.

"Motion Pictures in Relief," by H. E. Ives, Bell Telephone Laboratories, New York, N. Y.

"A High Speed Stroboscope," by H. E. Edgerton, Massachusetts Institute of Technology, Cambridge, Mass.

"Recent Improvements in Thermionic Devices," by M. J. Kelly, Bell Telephone Laboratories, New York, N. Y.

"Studio Organization," by Carl Dreher, RKO Studios, Hollywood, Calif.

"A Method of Directly Measuring Distortion in Audio Frequency Systems," by W. M. Tuttle, General Radio Co., Cambridge, Mass.

"Size of Image as a Guide to Depth of Focus in Cinematography," by J. F. Westerberg, United Artists Studio, Hollywood, Calif.

"Development of the Light Valve," by T. E. Shea, Bell Telephone Laboratories, New York, N. Y.

"Vertical Sound Records; Recent Fundamental Advances in Mechanical Records on Wax," by H. A. Frederick, Bell Telephone Laboratories, New York, N. Y.

"Western Electric Noiseless Recording," by H. C. Silent, Electrical Research Products, Inc., Hollywood, Calif.

"A New Bell and Howell Printer," by J. A. Dubray, Bell and Howell Co., Chicago, Illinois.

"The Bomb Microphone," by W. C. Miller, M-G-M Studios, Culver City, Calif.

"Studio Projection and Reproduction Practice," by J. O. Aalberg, RKO Studios, Hollywood, Calif.

"Sound Recording for Independent Productions," by L. E. Clark, Clarco, Inc., Hollywood, Calif.

(Continued on Page 24)

THE CRITICS

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Mary Pickford Planning Smashing Comeback

MARY PICKFORD has had her ear to the ground for some time, and has decided that the time is about ripe for her to step in and make a motion picture that has none of the odor of the sexy or gangster type of entertainment.

According to those close to Miss Pickford, she plans to go back to the type of role in which she became "America's Sweetheart." Miss Pickford in a statement issued recently declared: "I am most anxious to do a feature picture which will bring back the vast audience of children which in the last few years has so definitely fallen away from the motion picture theatre. I feel, too, that the present mood of the public will be particularly receptive to the sort of film entertainment which I feel best qualified to do".

At this writing Miss Pickford is enroute to New York where she hopes to close a deal for screen material which she believes will be suitable for her comeback.

S. M. P. E. Fall Meeting

(Continued from Page 22)

"Mechanism of Hypersensitization," by B. H. Carroll and D. Hubbard, Bureau of Standards, Washington, D. C.

"An Experimental Study of Several Methods of Representing Photographic Sensitivity," by R. Davis and G. K. Neeland, Bureau of Standards, Washington, D. C.

"The Variation in Emulsion Speed with the Distribution of Energy in Sources of Equal Visual Intensity," by R. Davis and G. K. Neeland, Bureau of Standards, Washington, D. C.

"On the Assignment of Printing Exposure by Measurement of Negative Characteristics," by C. M. Tuttle, Eastman Kodak Co., Rochester, N. Y.

"The Reducing Action of Fixing Baths on the Silver Image," by J. I. Crabtree and H. D. Russell, Eastman Kodak Co., Rochester, N. Y.

"A Device for Printing Sound Films," by R. B. Wood and S. Watson, Jr., Rochester, N. Y.

"Gamma by Least Squares," by D. R. White, du Pont Film Mfg. Corp., Parlin, N. J.

"Speed in Camera Lenses and Emulsions," by Lewis Physioc, Hollywood, Calif.

"Depue Automatic Sound Printer," by O. B. Depue, Chicago, Ill.

"Special Process Technic," by Vern Walker, RKO Studios, Hollywood, Calif.

"Sound in the Los Angeles Theater, Los Angeles, Calif.," by D. M. Cole, Electrical Research Products, Inc., New York, N. Y.

"Thermionic Control of Theater Lighting," by B. S. Burke, Westinghouse Electric and Mfg. Co., Pittsburgh, Pa.

"Sound Motion Picture Projector Equipment for the U. S. Navy," by S. W. Cochran, RCA Victor Co., Camden, N. J.

"Acoustical Treatment of Madison Square Garden," by S. K. Wolf, Electrical Research Products, Inc., New York, N. Y.

"Lighting the Modern Theater," by F. M. Falge, Beaded Screen Corp., New York, N. Y.

"The Screen—A Projectionist's Problem," by F. M. Falge, Beaded Screen Corp., New York, N. Y.

"Low Amperage Reflecting Arc Lamp for Portable Sound Equipment," by H. H. Strong, Strong Electric Co., Toledo, Ohio.

M. E. England Installing His New Sound Equipment

M. E. ENGLAND of Pittsburgh, who recently re-entered the sound equipment business here, announces installation of his new sound-on-film device at St. Mary's College, Northeast, Pa.; Woodies theater, Apollo, Pa., and the Pearl theater, Youngwood, Pa.

Known as the M. E. England sound-on-film equipment, two sound heads are being offered at a low price by the distributor. England also furnishes speakers, amplifiers and other theater supplies.

Make-Up For Fast Film

(Continued from Page 11)

Thanks, however, to the excellent cooperation granted us by the camera department and its individual members, we were able to conduct these tests in record time, and so satisfactorily that the only changes necessary have been those required by minor modifications of the film characteristics since its introduction. As we had expected, the new stock demanded a darker makeup. To be exact, we found that generally speaking the increase required was a makeup two numbers darker than that which would be used on the old stock under identical conditions. This, of course, is subject to the individual technique of the cameraman: but taking an average, the new film indicates the use of a No. 26 makeup for women, and a No. 28 for men. These, of course, are only generalities, since there must be allowances made for the darker makeups required by blonde types (which can usually be achieved by using powder one shade darker than the grease-paint), and by the individual lighting technique of the supervising cinematographer.

Makeup, let me repeat, can never be rigidly standardized. Each player, each picture, each scene presents its own individual problems. They can never be solved by rule, nor by the unaided efforts of one man, for success in makeup must be predicated upon not only intelligent, not to say imaginative, use of the materials at hand, but upon equally intelligent, whole-hearted cooperation between the supervising makeup artist and the supervising cinematographer. The one need not be an expert photographer, nor the other a skilled cosmetician: but each must know enough about the other's work and problems to be able to cooperate freely and efficiently, and to appreciate the other's difficulties without being told of them. Where this condition prevails, we can always be sure of the best of photography and the best of makeup—ideally attuned to each other.

Color Photography in the Arctic

(Continued from Page 17)

amazed me. A great part of an Eskimo woman's life is spent in chewing hides, and it is only natural that many of them literally chew their teeth away: here is an example of the understanding aid that Commander MacMillan brings to these people, for every season his dentist makes dozens of sets of false teeth for Eskimo women, restoring them to usefulness.

In filming these native crafts, color photography is again valuable, for only through it can we distinguish between wood and bone, and fully appreciate the beautiful patterns in which the Eskimo women make their clothes. For while they do not know weaving, they nevertheless arrange the different furs of which the garments are composed in remarkably effective patterns. And it is only through color photography that these can be appreciated. In fact, it is only through color photography that we can fully record any phase of Arctic life.



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Cineglow Three Element Recording Lamp

Day, Night Travelsign Placed On The Market

MARKETED under the trade name of "Motolog," a new day and night travelsign especially designed for theaters to attract attention as well as put over a message, is being put out by the Travelsign Trailer Service, Inc., of New York.

The new device delivers a message of 75 words, is brilliantly illuminated in multi-colors and is visible from a great distance, the company declares.



New Disc Marketed By RCA Photophone

RCA Photophone has launched distribution of a new type of disc record developed and perfected by the engineers of the RCA Victor Company at Camden. The new disc is called the Victrolac record.

Advantages cited for the new record over the old style of shellac record are: reduction in size to 12 inches diameter, reduction in weight from 24 ounces to four, flexibility, durability, improved tone quality and a minimum of surface noise.

"Ninety per cent of the producing corporations already have arranged with us to employ this record in transferring the sound tracks of their sound-on-film production for disc reproduction," said Lowell V. Calvert, manager of the department of recording operations.



Lens Tests

(Continued from Page 15)

I becomes identical in size (IS=OS) of projected pattern of O, then focus $F = D/2$. If unit magnification is NOT used,

$$\text{then } F = ID = \frac{D \times IS}{OS \times IS}$$

3. Locate and mark on lens mount position of optical center, OC, as measured from rear surface of lens; such distance being the difference between focus and back focus, or $= F - BF$.

4. Check by measurement the relative position of optical center and diaphragm (Iris) plane.

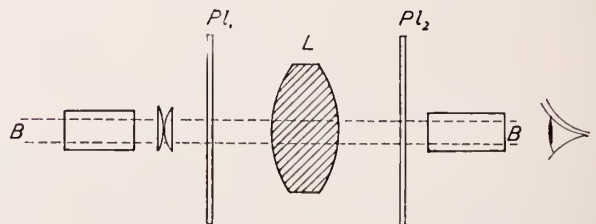


Fig. 4

EQUIPMENT

One swivel mirror. One Moore filter, No. 1. One ground glass. Optical bench. One adjustable lens holder. Two square-ruled ground glass plates. One adjustable lens holder. One projection lamp and condenser system for back lighting of Plate 1. One ocular magnifier. Figures 3 and 4 illustrate schematically the equipment.

(To be continued next month)

The

ultimate

IN

SOUND-ON-FILM RECORDING

General Sound Corporation, Ltd.

GRanite 4141 Station 107
 5630 Melrose Ave. Hollywood

.. In the Realm of Sound ..

Invention Records Sound On Undeveloped Film

A YOUNG FRENCHMAN, Rene Nublat, claims to have invented apparatus which permits the instantaneous recording of sound on film without the film's first having to be developed. He asserts that its adoption will result in a great saving of money to producers. He will soon give a demonstration of his invention to the film trade in Paris. His invention, he says, records mechanically, aided by electrical apparatus.

New X-Cell Sound Unit

R. Z. GLASS, owner of Public Address Service Co., distributors of X-Cell A.C. sound equipment, has announced the marketing of the "Paseo" junior and senior portable sound-on-film equipments manufactured in his own plant.

The projector and heads are said to be mounted in a steamer trunk-like case and speaker and amplifier are housed in smaller carrying cases. Reduction in prices on his X-Cell sound-on-film for theaters where disc is now installed, and reduction in complete X-Cell installations, have also been announced by Glass.

Make Low Outright Price on Universal Sound Unit

DESIGNED so that it is especially adaptable for theaters of 250 to 5,000 seating capacity, a sound-on-film device known as the "Economy" model and sold outright at a new low price is being put out by the Universal Sound System, Inc., of Philadelphia.

Some of the principal features claimed for the new Economy model include: full A. C. or battery operation, dynamically and statically balanced spiral gear drives, no chains, micro adjusted exciter carriage, half-inch main drive shafts and split guide rollers.

The cost of operation and upkeep with the Economy model must be lower, the company declares, because of the simplicity of design, the ruggedness of construction and the standard quality maintained throughout in material and workmanship. The model fits Powers, Simplex, Motiograph, Erneman, Hans Gurz, etc., projectors, the company claims and can be arranged for A. C. or battery operation.

New De Luxe Portable Put Out By Photophone

RCA Photophone, in addition to its recently introduced new portable sound reproducing equipment which was designed to meet the requirements of educational and industrial institutions, has developed a new de luxe special size equipment for the non-theatrical field. With the sound heads, amplifier and loud speaker which comprise the reproducing unit, a twin turntable, non-synchronous phonograph with power amplifier is included. By connecting the power amplifier for the phonograph to the output of the voltage amplifier, sound of sufficient volume for adequate distribution in an auditorium containing 150,000 cubic feet of space may be developed.

This volume of sound, it is said, is approximately the same as that to which the Photophone Standard size equipment is adapted. Two loud speakers may be used if desired, but only one is supplied with each unit.

Photographing Arc Lamp Is Marketed by Blue Seal

AN INEXPENSIVE carbon arc lamp, known as the Photo-Sun Lamp, for use in theatres using considerable photography for exploitation and advertising purposes, and adaptable to many other uses, has been developed and is being marketed by the Blue Seal Products Co., Inc., of Brooklyn.

It is made in two models, working on 110 volts a.c. One model is said to give an equivalent of two 1,000-watt incandescent bulbs, operating at from 10 to 12 amperes. The other model gives a light equivalent to 3,500 watt, and operates at 18 amperes, either a.c. or d.c., it is stated.

New German Recorder

CHEAPER apparatus for the making of talking pictures is promised in a new sound recorder system using the Braun valves and requiring but one-tenth watt for operation. Small producers in Germany are particularly interested in the apparatus because it is made to rent or sell at a much lower price than that charged by the big electric companies. If the new apparatus comes up to expectations, small producers hope to be able to stay in business.

Remote Control Offered for All RCA Equipment

ESSANNAY Electric Manufacturing Co. of Chicago is now offering a new Strong Remote Volume Control for all RCA equipment.

By the simple operation of a conveniently located push button, the device will regulate sound volume control instantly. Is inexpensive, easy to install, and there is nothing to get out of order, the company claims.

New Aluminum Screen

ANEW all-metal screen has been installed in the Metropolitan, Boston. This screen is the product of the Whiting & Davis Co. of Plainville, nationally-known makers of ladies' mesh bags. The screen is made up the same way that these mesh bags are fabricated, with millions of little aluminum squares linked together so that the whole fabric is flexible.

This is claimed to be one of the first absolutely fireproof sound screens to be put on the market.

Photophone in India

BUSINESS in the motion picture theatres of India appears to be booming, if the constantly increasing number of installations of sound reproducing apparatus may be taken as a criterion. Recently Van Ness Philip, manager of the foreign department of RCA Photophone, Inc., has received orders for ten complete units of equipment from Madan Theatres, Ltd., and Alex Hague, authorized distributors for Photophone in Bombay, and to these most recent orders may be added seventy-four units which have been installed in theatres in various sections of India during the past eight months.

Laboratory Department

Conducted by EMERY HUSE, A. S. C.

Principles of Sensitometry and Their Practical Application

Part 7

A BEGINNER in sensitometry might at this stage believe that all sensitometric work is done with a lamp standard whose color temperature rating is far below the rating of those sources used in actual production of motion pictures. It will be observed by examination of Table I in the preceding article that no satisfactory standard of luminous intensity is available which even approaches sunlight. In Table II of the preceding article it will be observed that the color temperature rating of sunlight is 5400°K. However, even the beginner of sensitometry knows that we do not use sunlight, actually, in sensitometry and that artificial sources of light are made use of in this type of work. To use these low color temperature sources it becomes necessary to use a selectively absorbing filter between the light source and the exposure plane in order to obtain the desired spectral quality. For many years the cylindrical acetylene flame standard has been used as the light source for sensitometric work but for sensitometric work involving speed determinations it was always used in combination with the Wratten No. 79 filter. The radiation emitted from this combination of acetylene and the No. 79 filter matches very closely in color that from noon sunlight. It must be realized of course that this match is not precise but the departure from actual matching is not sufficiently great to be at all serious from the practical standpoint. Many tests have been made which show that speed values determined with the acetylene flame plus the 79 filter using photographic materials differing widely in spectral sensitivity agree very closely with speed values obtained by the use of actual sunlight. The 79 filter is very stable and can be manufactured to within narrow tolerance limits and then standardized with the required precision. It has been found that this combination of acetylene and the 79 filter gives a very satisfactory standard source for the sensitometry of negative materials.

Use is also made of tungsten lamps operating at color temperatures in the neighborhood of 2400 to 2600°K. Special filters are made to convert lamps of such color temperatures to sources of appreciably higher color temperature.

It is also possible to make liquid filters which can be used with artificial sources of low color temperature and which filters raise the effective color temperature of the source.

It can be seen, therefore, that it is possible to have sensitometry on a laboratory basis of such precision that exposures made in the laboratory on a sensitometer can be used as a guide for the processing of films exposed under practical conditions, i.e. picture negative, etc.

It is interesting to note at this point in discussing this subject of light sources used for sensitometric exposure that the International Congress of Photography has for some years been attempting to standardize a satisfactory unit of photographic intensity. At the Seventh Congress which met in London in 1928 a resolution was passed adopting a 2360°K. source screened with a liquid filter as a means of realizing the international units of photographic intensity, which is defined as one visual candle-power of radiation of the quality emitted by the source filter combination. A detailed description of the Davis-Gibson filter may be had by reference to the Transactions of the Society of Motion Picture Engineers Volume 12, No. 33, April 1928.

Technicolor's Vital Patent

WHAT APPEARS to be a sweeping victory in the color field has just been scored by Technicolor by the issuance of a patent, embracing 234 claims covering phases of color production, to Dr. Leonard T. Troland, of that company. The patent is said to cover rights which have been in dispute since 1921.

Dr. Kalmus, president of Technicolor, declares that, in his opinion, the claims granted will give Technicolor power over the majority if not all of the various methods of manufacturing color films. The patent is said to be unique in that its 234 claims constitute the largest number ever issued on a single patent by the United States Patent Office. It was first applied for by Dr. Troland, who is Technicolor's research director, in 1921.

Technicolor says the patent gives it the sole right to employ "the fundamental idea and method for coloring motion pictures and making both a negative and a positive print consisting of a layer of emulsion sensitive at different depths to different colors of light."

Dr. Kalmus further says that the patent embodies a large number of claims on the method of using two or more films, or two or more layers of emulsion.



New Device To Regulate Sound Receives Patent

EUGENE S. HALFORD, New Orleans engineer, has recently patented a device called the Rototone, which he claims can facilitate the means whereby sound may be accurately taken from or added to a motion picture and which can control sound volume at specified points, allow additions in sound without increasing the length of the film and provide the director with a chart whereby he has a record of each one-hundredth inch of film taken, which, when turned over to the cutting room, may serve as a guide to piecing scenes together.

The device consists of a cylinder, over which is placed a chart divided into squares by closely spaced lines; an electric stylus on an arm, which moves over this chart governed by an electro-magnetized sleeve. The stylus is also electro-magnetized and the chart is cut away in place to allow contact which governs the starting and stopping of sound recording devices, amplifiers, volume controls, or extraneous sound or light effects at a predetermined position in accord with the images of the film.

The patent, it is understood, has not yet been disposed of, nor is early marketing of the device anticipated. Halford began the invention before the advent of talking pictures. The basic principle is that of the range finder on war vessels.

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Notes of the Motion Picture World

Levee Heads Academy

M. C. LEVEE, executive manager of Paramount Studios, last night was elected President of the Academy of Motion Picture Arts and Sciences. He succeeds William C. de Mille, who has held the office for the past two years.

Other officers elected were—Conrad Nagel, re-elected Vice-President; Fred Niblo, re-elected Secretary; and Frank Lloyd named as Treasurer. Clinton Wunder and Lester Cowan were re-elected Executive Vice-President and Executive Secretary, respectively.

Carry Your Censor

HEREAFTER American newsreel cameramen must hire a government censor to accompany them on picture-making trips under a new censorship just imposed. Films will be inspected and sealed by the Interior Department before shipment to the United States, and will be shipped direct to the Mexican consulate at their destination, where the seals will be broken and the films forwarded to the respective companies.

A Good Move

SETTING A PRECEDENT in the motion picture industry for relief of the unemployment situation, the RKO-Pathé studios have established a six hour working day for men of the construction force. This move, instituted by Dave Garber, superintendent of construction, will increase the number of men employed by twenty percent.

Workers affected by the new schedule include carpenters, painters, grips, plasterers, laborers and such construction specialists as blacksmiths. Under the setup, the construction force is operated in two shifts. The first works from eight o'clock in the morning until 2:30 in the afternoon, with a half hour off for lunch. The second shift goes on duty at 2:30 and takes the half hour off for the evening meal.

Not only does the six hour day provide employment for many more men but it allows the workers added time for leisure and recreation which Garber believes will be reflected in increased efficiency on the job.

Block, McGuinness to Columbia

JAMES K. MCGUINNESS and Ralph Block have been engaged by Columbia to take part of the production activities off Harry Cohn's shoulders.

With Cohn, they will each supervise production of eight pictures. Columbia's production for this year calls for 24 features.

McGuinness and Block will carry the title of associate producers. Previously, both had been in the same capacity at Fox.

English Talkie Set for \$1,300

A. E. MORRISON & Sons, Ltd., of Leicester, announce a new talking picture set to sell for \$1,300 cash, or \$10 a week. It is for theatres seating up to 500. No batteries are used.

Stahl With Universal

JOHN Stahl will go on a new setup with Universal after the completion of "Back Street."

His present contract calling for a set number of pictures closes at that time. New arrangement will have the director on a straight salary basis for a year with options.

Battechlor Back

GEORGE BATTECHLOR, producer of Chesterfield Features, is back in Hollywood and starts another feature this month. Richard Thorpe is to direct. Buddy Shyer is to be the assistant. The company may work at Universal or the Tec-Art Studios, it hasn't been settled as yet.

Vice-President Curtis Hollywood Guest

CHARLES CURTIS, vice-president of the United States, has accepted the invitation of Louis B. Mayer and M. C. Levee to attend the dinner of The Academy of Motion Picture Arts and Sciences at the Ambassador, November 10.

This visit will be the first that the vice-president has made California since he was elected. The Academy and the entire motion picture industry feel signally honored.

The Academy expects this banquet to be unprecedented in motion picture history.

Mayer Returns

LOUIS B. MAYER is back at MGM following an eastern trip. As well as conducting business at the home office in New York the executive visited President Hoover in behalf of Governor Rolph and the Olympic games committee.

Frank Mastroly Named Assistant To Laemmle

FRANK MASTROLY, for four years assistant export manager of Universal, has been promoted to assistant to Carl Laemmle. Jack Ross continues as Laemmle's secretary, but Mastroly will be with the Universal chief at all times both in New York and on the coast.

New 'Music Master' Series Planned By FitzPatrick

JAMES A. FITZPATRICK, who recently returned from a tour through England and Ireland, is planning a new series of six one-reel "Music Masters." Production will start shortly in Hollywood. These will be the first sound Music Masters made by FitzPatrick. Eighteen silent reels of the series are now being distributed independently. MGM may distribute the new series.

According to FitzPatrick, film taken on his recent trip will make up five Traveltalks yet to be delivered to MGM on the 1931-32 schedule of thirteen. MGM holds an option on a second series for next season.

What's What in Make-Up

The Proper Application of Make-Up

SINCE make-up is such an important part of picture making, either professional or amateur, the following directions for the proper application of make-up are presented. These rules have been prepared by Max Factor, internationally known make-up expert, and should be of untold value to any amateurs who are planning to enter a picture in the \$1000.00 Amateur motion picture contest now being conducted by this magazine.

1. **Preparing the Face**—The face must be thoroughly clean before make-up is applied. The best way is to wash the face with soap and water. Men should be smoothly shaven.

2. **Base for Grease Paint**—It is often necessary to use cold cream before applying grease paint. In my laboratory, however, we have developed a grease paint which eliminates this need.

3. **Grease Paint Application**—Squeeze about one-quarter of an inch of grease paint from the tube into the palm of the hand. Then with the tips of the fingers of the other hand apply the grease paint in "dibs and dabs," covering the face with little dots of grease paint until it acquires the appearance of a freckled face. Grease paint must be applied sparingly, too much will spoil your make-up.

4. **Spreading Grease Paint**—Now remove the grease paint from the hands and dip them into cool water, then with the finger tips moistened with water spread the grease paint over the face, blending it smoothly, evenly and thinly into the skin. The movement of the fingers should be from the center of the face outward. Keep dipping finger tips into water as it is essential to blend the grease paint in order to have a smooth and thin application.

5. **Shadowing the Eyelids**—Apply a thin film of lining color to the eyelids with the finger tips, using a light outward motion, blending it carefully upward and outward toward the eyebrows and the outer edge of the lids. No decided line should be visible. Only in special cases should a shadow be used on the lower lids.

6. **Penciling Eyes**—Line the upper and lower lids by drawing a fine line with the dermatograph pencil where the eyelashes meet the eyelids. Draw this line outward and extend just a trifle, the smallest fraction of an inch.

7. **Moist Rouge**—Apply the rouge to the lips, being sure to give an application to the inside of the lips, so that when the mouth is open, smiling or talking, the line of the rouge will not be seen.

8. **Important Rule**—It is important to follow the application of the cosmetics in exactly the rotation given. All these cosmetics have an oily base and it is essential that all make-up having an oily consistency should be applied before powder or dry make-up is used.

9. **Applying Face Powder**—Then apply the powder. This must be done with a patting motion. Pat the powder on until it is absorbed by the grease paint. Apply the powder over the lip rouge and eye lining profusely. If there are wrinkles around the eyes, pat over them again, drawing the wrinkles apart.

10. **Removing Surplus Powder**—To give your complexion a smooth and velvet finish it is of vital importance to remove your surplus powder. Brush the entire make-up lightly with a special brush and carefully remove every particle of extra powder.

11. **Lip Effect**—After removing the powder from the lips, moisten them with your tongue. This will result in a fine, natural color and the rouge will stay on without retouching.

12. **Make-Up the Eyebrows**—Either a dermatograph pencil or masque may be used. If a pencil is used, draw short, little hair lines, following the natural shape of the eyebrows and accentuating the shape desired. If masque is used, wet the brush and rub on the cake of masque. Now, with the brush apply the masque lightly to the eyebrow.

13. **Make-Up for Eyelashes**—Men as a rule do not make-up the lashes. Women may use either masque or cosmetic. You can accentuate the lashes effectively with masque, but if you want to give the appearance of beaded eyelashes cosmetic should be used. Place the cosmetic in a small container and hold over a flame until melted. Dip paper liner or orange-wood stick into melted cosmetic and apply to the lashes. For beading apply cosmetic to the tips of lashes repeatedly until they acquire the desired beaded appearance. The bead should hold about two or three lashes.

14. **Completing Face Make-Up**—Smooth out the make-up and rebrush it over very carefully with powder brush.

15. **Liquid Make-Up**—Women should make-up the shoulders, arms and other exposed parts of the body to harmonize with the face make-up. For this purpose liquid make-up is used. Start the application at the neck where the face make-up stops. Apply make-up to the neck, arms and hands. Apply with stroking motion and rub one way only until dry. This make-up is easily removed with soap and water.

16. **Removing Make-Up**—Cold cream will dissolve grease paint make-up. Massage the face well until all the make-up is completely dissolved. Then wipe the face thoroughly. It is advisable to wash the face immediately with warm water and plenty of soap, and then rinse in cold water.

17. **Artificial Eyelashes**—The eyelash adds much beauty and charm to the expression of the face and is a useful and an ornamental feature. To the woman who has been deprived of a natural growth of luxurious hair on the lashes, this may come as an aid of great value. The artificial lash, very simply applied, defies detection, and can be worn on stage, screen or on the street. The lash should be cut to fit the lid from each corner of the eye. Spread a film of spirit gum on the foundation of the lash. Allow to dry for a minute, then press the lash firmly against the eyelid, directly above your own lashes.

Chart Suggesting Correct Shades of Make-Up

The following chart will give you approximately the correct shades for various types. The color scheme of "in-between" types may vary, i. e., a blonde type may have hazel or grey eyes; a brunette may have blue or grey eyes. But ordinarily, a color of both hair and eyes distinguishes the blonde from the brunette as follows:

Blondes: Blonde hair, blue eyes and fair skin.

Brunettes: Dark hair, dark eyes, medium skin.

The colorings of Panchromatic make-up are neutral tones of tan and warm brown. When it is completely applied the effect is a monotone complexion, which is the correct color for the best photographic results, with any type of film stock used.

(Continued on Page 50)

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Here are the Rules and Regulations of the Contest:

- The American Cinematographer will present a prize of \$500.00 for what its judges consider the best 16 millimeter picture submitted in this contest. \$250.00 will be given as second prize; \$150.00 as third prize; and \$100.00 as fourth prize, a total of \$1000.00 in prizes.
- This contest is open **ONLY** to **AMATEURS**. No professional cinematographer will be eligible to compete. It is a contest solely for the amateur, either the individual or the club.
- The contest officially opens November 1, 1931. The contest ends at midnight of October 31, 1932. All pictures must be entered by the closing date or they will not be considered. Entries mailed or expressed bearing the date of sending will be accepted if they reach **THE AMERICAN CINEMATOGRAPHER** office after October 31, 1932, providing the date shows they were sent before midnight of October 31, 1932.
- Pictures submitted in this contest will be judged upon photography, composition, direction, acting, cutting and entertainment value. And only silent pictures will be eligible for the contest. The judges, whose names will be announced later, will include outstanding and widely known Cameramen, Directors, Actors, Writers and a group of nationally known Motion Picture critics from some of the best known newspapers in America.
- The decision of the judges will be absolutely final, and there can be no appeal from their decision. Announcement of the awards will be made as soon after the close of the contest as possible and checks will be mailed the winners.
- Pictures may be submitted either by individual amateur movie makers, or they may be submitted by Amateur Movie Clubs. However, they **MUST BE** photographed on 16 millimeter or 9 millimeter film. Accompanying each entry must be a sworn statement to the effect that no professional cinematographer assisted in the making of the picture. No pictures will be accepted which were photographed on 35 millimeter film and then reduced to 16 millimeter.
- This contest is open to amateurs and amateur clubs anywhere in the world, with the following conditions.

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- If you are a paid-up subscriber to **THE AMERICAN CINEMATOGRAPHER** you are eligible to enter the contest. If you are not a subscriber just send in your check for a year's subscription and you are eligible.
- In the case of Amateur Clubs the following rules apply:
- If a club with a membership of 20 or less wishes to enter a picture, the club will have to have a minimum of 5 subscribers among its members. Any club with more than 20 members will have to have a minimum of 10 subscribers among its members. For any further information you may desire, write the Editor of the American Cinematographer, 1222 Guaranty Building, Hollywood, Calif.

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Amateur Movie Making

by WILLIAM STULL, A. S. C.

THE ANNOUNCEMENT of the **American Cinematographer** Amateur Film Competition last month had, for the discerning, far greater significance than could be read in the lines of type informing the world of the rules and prizes. It represented the first tangible recognition by the professional cinematographers of their non-professional fellows. For behind this contest is the American Society of Cinematographers, a world-wide organization composed of the outstanding professional cinematographers, "the camera-masters of the world," as one distinguished scientist has phrased it. Considering the individual and collective achievements of the members of this body, it is only logical that they should be the ones to first recognize the fact that it is the duty of the professional to encourage amateur cinematography by every means possible. For whether it be true or not that today's amateurs may be tomorrow's professionals, as certain enthusiasts like to state, it is incontestable that today's amateurs—and tomorrow's as well—are the real audience to whom the professional must play, and whose increasing appreciation of cinematography will do more than anything else to aid the professional in his unceasing strife for improvement in things cinematographic. And in view of the exceptional work of such amateurs as Dr. J. S. Watson, Jr., A.S.C., and others, it cannot be gainsaid that many of today's greatest cinematographers are, from choice, numbered among the amateurs. Therefore the sponsors of this contest have initiated it with two thoughts in mind: to aid them in their work of fostering a closer understanding and cooperation between the professional and amateur groups, and to give world-wide recognition to the achievements of the advanced amateur cinematographer.

What It Takes to Win.

The fact that this competition is to be conducted and judged by professionals—not only professional cinematographers, but professional writers, professional directors, professional actors, and professional critics—means that the entries will be judged by the same standards by which professional productions are evaluated by their makers. What are these standards?

I think that they may be summed up by the single word "finish." That is the quality that most clearly distinguishes the work of the professional in any line from that of most non-professionals—that intangible completeness and coherence that is the result of careful planning and painstaking execution. But while it is more frequently characteristic of professional efforts than of amateur ones, it does not by any means follow that it is not, or cannot, be found in non-professional work. It is a fact, however, that too many amateurs overlook the importance of this feature, and allow themselves to fall short—not of perfection—but of the nearest approach thereto that is possible under the conditions of the moment. They are too willing to condone lapses, whereas the professional realizes that no excuses are ever possible—that his sole advocate is what appears on the screen.

Entrants in this contest must first of all adopt this attitude in work intended for the competition. Since the pictures are to be judged by an impartial board of judges, you cannot expect them to make the allowances that you and (if you are lucky), your friends would make if you were showing the film in your home or your club. You may see a scene with your mind's eye, as well as with your physical eyes, and so understand just why it falls below par in this particular or that; they see it

only with their fore eyes, and appraise it solely by the evidence you have provided them on the screen. If you have not given them a finished production to judge, they can only adjudge it for what it is, without inquiring why it is such.

What is "Finish?"

We have said a good deal about "finish," and its importance; but what does it actually consist of? Not perfection, but a conscientious striving after perfection in every detail; completeness—and coherence of purpose; economy of effort. It is probably best understood by those of us who have attended "amateur try-out" nights in a vaudeville house. The professional acts on the regular bill—no matter how poor they might be—had something that differentiated them from all but the best of the amateur ones which followed. That something was "finish." The professional was able to put over his point with a minimum of effort, whereas the amateur generally worked hard to do it—too hard, in fact, for he strove so mightily that it became painfully obvious, and the audience lost sight of his point in the mechanical effort by which he strove to put it across. Then, if something went wrong and the trouper "got the bird," the professional would either ignore it, or turn it to his advantage, whereas the amateur would falter, stop, or at least continue in a sullen way that antagonized his audience. Lastly, the professional "turn" seldom showed any ragged edges, whereas the amateur one almost invariably did: this was not because one was professional and the other wasn't, but because the former had rehearsed and rehearsed his act looking for those ragged edges, and trimmed them off smooth before allowing anyone to see it.

In a motion picture, "finish" is much the same: an absence of any intimation of the mechanical; economy of effort; and, most of all, completeness of detail. In the story, it means strict attention and adherence to narrative requirements. A good plot, logically developed: every character, location and motivating factor adequately "planted," yet without dwelling unduly on this process; absence of all extraneous factors; and the whole smoothly and—if possible—originally carried along to a logical and naturally dramatic **denouement**. In direction it means first and foremost an understanding of tempo, plus naturalness. In acting, it means proper timing, and economy of effort. In photography, it means the use of the camera not as an end in itself, but as a means to an end—the story; proper sequence of camera-angles; proper matching of the visual quality of the scenes and the mood of the story; and uniformity of photographic quality throughout. In cutting, it means again the understanding of tempo, of photography, and of story construction. In titling, it means adherence to the story: dramatic feeling, brevity, and a complete absence of "fine writing." Summed up for the entire production, it means not an ambitious thing incompletely accomplished, but a definite idea—simple or otherwise as the individual's ability may dictate—completely and efficiently realized, without slight to any detail whatsoever. Far better a simple thought carried through to completion with certitude than an ambitious one badly and incompletely executed.

From the foregoing, it might be inferred that only dramatic films will be considered in the competition. This is by no means the case: a well executed travelogue, abstract cinema, or documentary film will have an equal chance: but it is almost inevitable that the dramatic productions will be in the

(Continued on Page 46)

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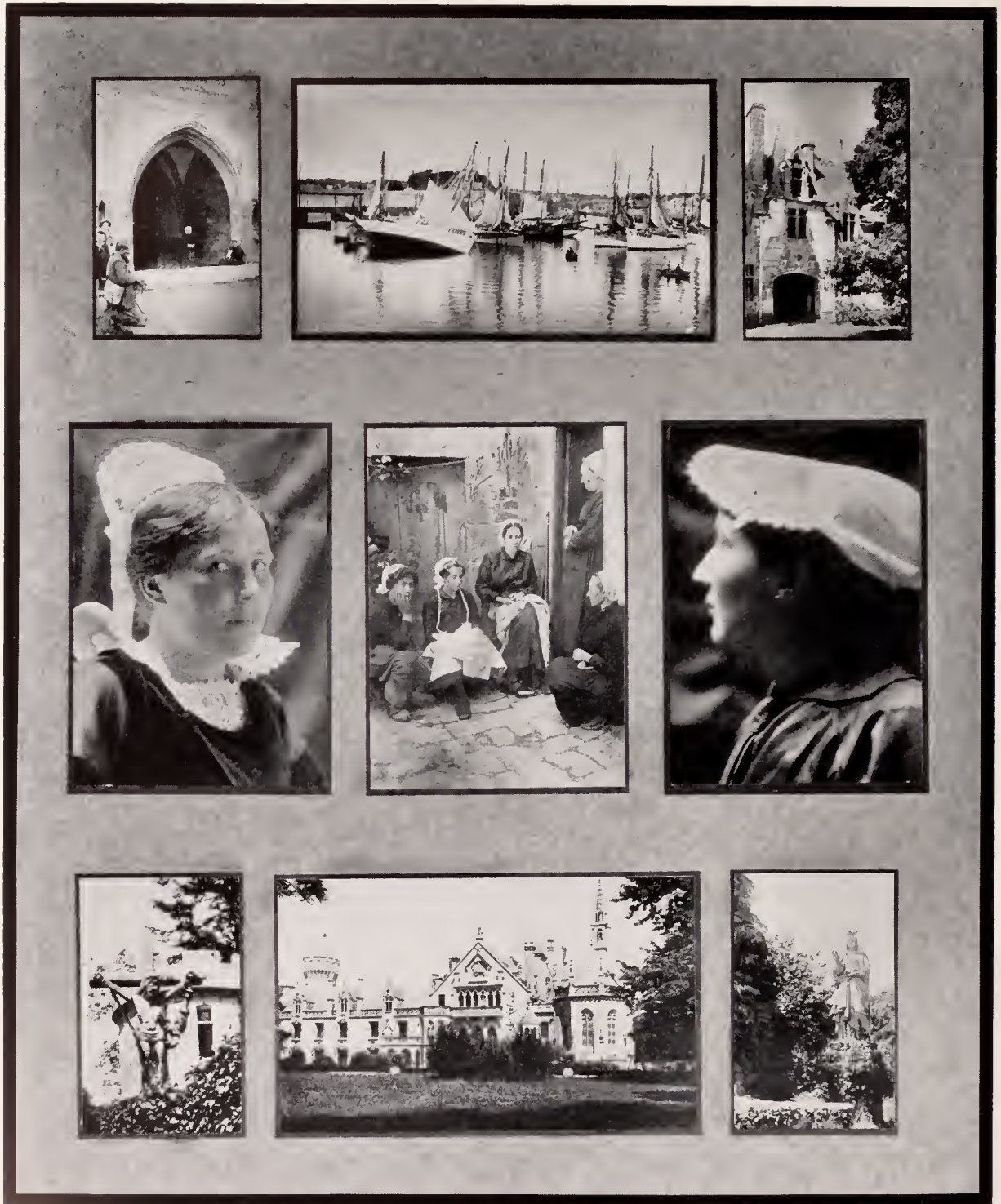
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Babbling About Brittany

by LAWRENCE GRANT

This is the eighth article of an unusually interesting series which Mr. Grant has written for this magazine. The concluding article will appear in the December issue.—Editor's Note.



DO NOT know why it is, but French people, especially those in small towns and villages give the idea of restless energy and bustle, and this is something quite different from our own rush and hurry, for the former is done without apparent effort, while the latter is wearing on the nerves, the health and the temper. But these Gallic persons always seem to be "going places." In family groups, in scattered twos and threes or in small crowds. Children going to school, women going to market, soldiers going on duty, merchants going to business, local magnates going to a meeting. They are all going somewhere and they are intent on arriving.

They have reduced the art of working hard and playing easily to a science. They will work like mad from early morning in their stores and offices. Sharp at noon they will close up. Off they go to their favorite restaurant or their homes. They will sit outside the restaurant if the weather permits, possibly they will be met by their wives and children, and for two hours they will eat and be as gay as though nothing in the whole world had to be done and nothing ever was going to be done again. Sharp at two, or a few minutes before, they are gone. Store doors are opened, and they are there again so concentrated on their jobs that it would seem to you that such a thing as two hours of leisure was, to them, unthinkable.

In fact the difference between French, English and American people on this point is interesting, and as one who has lived in and liked each country and each peoples it seems to me that the American spends too much time with, and in, his business, works too hard at it, takes it home with him, never forgets it, lets it dominate him, and devotes altogether too little time to his recreations, and even when he is recreating is apt not to forget it; the Englishman spends too much time away from his business, doesn't work hard enough at it when he is there, forgets it when he leaves, and makes his week ends last too long; while the Frenchman works from early hours like a dog, concentrates and forgets pleasure when he is at business, then shuts it all off completely and plays like a child with as much earnestness as he gave his work during working hours. But he does not confuse the two, he has solved the problem of work while you work but do not overdo it, and play while you play but not all the time.

Don't waste anything. Time, Food, Money, Energy. Conserve everything, use everything. Remember it was a Frenchman who first made a fortune from the garbage can by collecting old sardine boxes and stamping out tin toy soldiers from them, painting them in the uniform of different countries and regiments and so started the great toy soldier industry.

And—there is no unemployment in France.

Concarneau is the nearest rival to Douarnenez as a sardine port, and is described by dear old friend "Joanne," as:—"sale et relents nauseabond, mais qui attire un grand nombre de touristes et d'artistes par son aspect pittioresque." For those whose knowledge of French is only of the working variety I may say that "relents nauseabond" means a musty smell of the most nauseating character.

I think this description a little unkind. It is rather smelly but I would hardly say it nauseated one, and as I said somewhere else it is unfortunate but true that "pittioresque" is frequently synonymous with "sale."

And after all think of our ancestors of not so long ago, just about Washington's date and a little earlier, when the last word in fashion was powdered hair, and lovely ladies who look so pure and sweet in their portraits had their hair fixed and slept with it so for days, and did not take it down till it was inhabited by things, even, as the story goes in one case, till a mouse had a family there!

So let us open our eyes and close our nostrils. Then Concarneau will be lovely, with the only fault, just a little too much of the "grand nombre de touristes et d'artistes"; for truth to tell just a shade too many English and American to my taste there. When I travel I like to be the only alien, the only nuisance, the only blot on the local beauty, and I resent the presence of another traveller. I like "Brittany for the Bretons" with just an exception in my favor.

The harbor and the old town have more interest and charm than Douarnenez, with about as many sardine boats, but frequently the sardines leave the locality, and then the distress among the fishers, who are not so thrifty, is rather severe, though again I do not think "Joanne" has a right to state that they live in drunkenness.

However tourists do not live in the old walled in town, they live in the good hotels in the outer part, so they are spared both the "nauseabond" and the "ivrognerie" unless they wish to visit the enclosed and interesting old city. They can stay and exchange banalities with their own kind in select comfort, or go and have an interesting time with the natives. One dull, the other dirty. It's a matter of choice.

Looking at that little picture by the side of the boats at low tide in the harbor I am reminded of one of the scourges and real nuisances of France and most of Latin Europe. The professional beggar. The maimed men living on charity, and exposing the most horrid complaints and the most revolting deformities as "Exhibit A" with which to enlist your sympathy.

Some of the most annoying will thrust an unsavory arm stump right in your face and almost hold you up for some sous or better. They have their stands, and outside nearly every church you will find them, they carry a certificate from the Mayor or someone licensing them to do this. They are so importunate and so depressing. Some of them sing, or intone, their whole life story, which would appear to have been one long succession of gruesome misfortunes. They are unfortunate and one must feel sorry for them, but one would like to think the authorities could find a better way to take care of them.

Of course we have them here, for I remember one in New York who had a certain spot where he was to be found every day, but when some fuss occurred with him, it was disclosed that he came to his stamping ground in a splendid car, which he left at some distance, and had a bank account to be envied. There is a man down town in Los Angeles, who, I am credibly informed, owns a block or so of property.

Not far from here is the Chateau of Keriulet, and I cannot refrain from showing more than one picture of this example of bizarre taste. It is of modern construction in imitation of the times of Louis XIIIth and is covered with bad ornaments and the grounds full of bad statues, mostly of a religious subject. It is a pretty sad spectacle, though its imposing appearance awes many tourists into the belief that it is splendid. It was bequeathed to the State by the Countess Chauveau-Narischkine and she left it full of lovely works of art, so inside is better than outside. Originally it was a rather good example of Renaissance, but unfortunately the lady when left a widow married again, a man who had never possessed money or taste before he met her. He got control of her money but not her

taste and renovated the chateau, and as the old caretaker said to me shrugging his shoulders, "Monsieur renovated a perfectly good ruin, and ruined it".

Turning attention from the women who "run" the hotels in Brittany to the girls who serve in them, here we have two charming examples, Josephine, who was second lieutenant to Couillard at Le Faouet, and Marie from Lorient. These are the girls who are graduating, learning the ways to manage things, and will succeed the present chatelaines when due time comes, and from the way they look after you it seems that the reputation of their predecessors will lose nothing in their hands. Unless the rush of modern tourist travel with automobiles which enable people to see the world who years ago would get no further than a neighboring seaside place in their own country spoils everything. In the past, "avant la guerre," as they will "date" things, those who made such pilgrimages were the wealthy leisured educated classes who took trains and drove in leisurely way through a country, people who had servants of their own, knew what it was to enjoy service and attention, and how to expect and command it. Thus was the spirit of these places and these people kept. With the coming of automobiles and nouveaux riches this is all in danger, for instead of encountering dignified contact, these hotel women and girls are now treated in many cases to either haughty domineering, over intimate friendship, or undesired "freshness" from the cheaper male members of the party. In time the service will adjust itself to the level of those served. Which is a pity. But it is inevitable. Even today look at the negro in the South and compare him with the same type in New York.

Automobiles have done lots of things like that. I can remember when the first automobiles began to run about the country lanes, and gay sparks thought it was the thing to run a Gaiety girl down to Brighton and back, and some wit referred to the "dear old lanes of England, reeking of petrol and patchouli". The first picturesque thing to disappear was the village forge, no longer "under the spreading chestnut tree, the village smithy stands." At first the blacksmiths, poor souls, tried to stem the tide by pretending to mend stalled autos, but alas that frequently turned a stall into a wreck. So they had to go, and their place is taken by service stations, generally ugly, and with no old world flavor at all; then too many of old time inns became modern roadhouses, and the quiet contemplation of Ann Hathaway's cottage, for instance, now takes on all the atmosphere of an international Rotarian meet.

And as machinery comes in, manners go out. No time for curtsies and courtesies. Get in and get on.

And knitting, as the two old ladies are in the lower row, and spinning with a "rouet a filer" as the little old soul is in the upper row, and weaving as is done all over Brittany will pass along with everything else. Mr. Gandhi may preserve it in India, though I doubt it, for when they get their independence, and can buy cheaply what they spend hours making, young India will buy. He may halt the British nation but he cannot stem human nature.

The little old spinner I had difficulty in finding, but when I succeeded she was worth it. She lived all alone, was just as sweet and clean as she looks. She is not "dolloed up" for her picture, I came in on her unexpectedly. Her cottage had no floor but Mother Earth trodden very hard and kept spotlessly clean. Her wonderful though small collection of lovely linen was in orderly row on shelves, her furniture, including her carved Brittany bed polished to the last shine. And she could not and never had spoken one word of French. She was Breton to the backbone, and regarded French people as rather odd mannered foreigners.

She had a grandson who she assured me had gone to Berlin, but as he had not told her where he was going to stay she had not been able to write to him!

The limitation of family so associated with the richer and middle class French does not extend much to peasants and

fisher folk. They have children and are proud of them. I met one youngish woman, that is she was about thirty-five, mother of thirteen children, whose husband was at the war, and I said to her:—"What will you do when he comes back?" She replied in a roar of laughter:—"Start in and have thirteen more as a thank offering!"

I met another woman who had four sons at the war, and her husband. She was careworn and sad for three sons had been killed. She had received the fatal telegram which came to all mothers who had lost sons. Yet she was praying God if she must lose one more, that it be her son, just so that "He" was spared and returned to her.

Look at them on this page opposite. Old women; chattering women with their children; and a young woman with her first baby whom the Father at war had never seen. They are wonderful. No wonder when the country is referred to by name the feminine pronoun is used:—"Vive LA France" for the women are most astonishing part of this adorable country.

This woman had a letter from her husband which said among other things, that:—"I enclose you twenty-five francs which you may be glad to get". There was no twenty-five francs. But there was a Post script, and it said:—"As a man called a censor will open this letter as it goes to you, I thought it better not to enclose the twenty-five francs".

Auray, of which we have two streets and two views, is the getting off place for Belle-ile-en-mer, the island on which Sarah Bernhardt had a wild rocky home to which she could retreat from the rush of Paris life, is a most picturesque place, though generally visitors only go there on the way to the great and famous Pardon of St. Anne D'Auray, and if you stayed at the hotel Grand Hotel du Lion d'Or et de la Poste at just the right moment you would encounter the "Divine Sarah" staying with her friend the patronne over night, on her way to Belle-ile.

When the train first came to Auray the inhabitants thought it would be noisy and a detriment to the little town if it came in too close, so the station is away out of town, and you take quite a little ride in a rickety bus before you rest in your hotel. Now of course they realize their error, but too late to repair it.

300 Watt "No Resistance" Lamps for Victor

VICTOR ANIMATOGRAPH CORPORATION, Davenport, Iowa, announces that a new G-E Mazda Projection Lamp of 300 Watts rating which does not require any form of lamp resistance is now available for use in all Model 3 and 5 Victor Projectors and Animatophones.

The Lamp may be obtained in voltages of 105, 110 and 115.

Initial tests indicate that this new 300 Watt lamp may closely approach in intensity of illumination some of the highly efficient low voltage lamps which employ rheostats or transformers to reduce the line voltage to that of the lamp rating.

It is even believed that it may fully equal and possibly excel the lamps employing transformer resistance. Tests to date, however, show that it is not quite equal to the 165 watt-30 volt lamp or the 375 watt-75 volt which are used with the VICTOR variable resistance rheostat.

This new 300 watt lamp is of the regular 16 mm. T-10 Size and is equipped with the bayonet type prefocused base.

It may be obtained from Victor dealers or direct from the Victor factory at Davenport, Iowa.

Sound Apparatus at \$375

COMPLETE sound equipment for two projectors is to be offered in England at \$375, the lowest price at which sound equipment has ever been sold there. It will be offered by Eugen Forbat & Co. of Vienna which has sold 800 of these sets in Germany. The price was recently reduced from \$500.



1., 2. and 3. Quimperle. 4. and 6. Streets in Auray. 5. Boutiques at St. Anne d'Auray. 7. Door of an Estaminet. 8. Pardon Procession of Notre Dame de la Clarte, Baud. 9. Door of a Church at Baud.

16 mm. in the Air

by WALLACE BEERY

AVIATION has reached the point where every one of us has plenty of opportunities to fly. Many of us either pilot our own planes, or have friends who do—and all of us can at least fly in the safe, comfortable machines daily plying the airways of the world. Flying is no longer dangerous nor expensive; but it still is, and, I believe, always will be, the greatest sport in the world. And to the users of amateur movie cameras it is also an invariably interesting subject, for no other subject offers such unusual opportunities in either the making or the showing.

Unfortunately, however, far too many of us have overlooked the possibilities that aviation offers our Filmos, or, if we have not overlooked them, we have ignored them through the mistaken idea that aerial cinematography was something excessively difficult, and requiring specialized knowledge and equipment available only to professional cameramen. This is not the case at all: the ordinary Filmo or Cine Kodak, plus just a little intelligent operation, will make aerial shots that quite equal those made by all but such rare professionals as Harry Perry or Elmer Dyer. In other words, amateurs such as you and I can easily do just as well with our cameras in the air as we can on the ground, and sometimes better.

The exact methods that should be used differ, naturally, under different conditions. Probably the most important factor is the type of airplane used. In an open-cockpit machine, you have things to contend with that you don't meet in a closed one, while in a commercial airliner conditions are still different. In either case, however, the actual operation of the camera is much the same.

The first thing to be remembered is to always use panchromatic film. Either the negative or the reversal type may be used, and any brand will do so long as you are accustomed to using it. I have found, in my own work, that the regular "pan" is far better than the newer supersensitive types, for generally speaking, you are not going to need either the extreme speed nor the improved color-sensitivity of the new film. In the air, as you climb higher and higher, you will find it necessary to reduce your exposure just as you do when you are working in the mountains. Furthermore, if you are attempting to photograph other planes, you will be getting much more of the intense blue sky in your picture than you do in the ordinary ground shot, so you will have to allow for this in your exposure, too. Naturally, this increase in the blue demands the use of a color filter; no one filter will give the best results under all conditions, though the K-2 is about as good for all-around use as most of us could ask for. If we are particular, however, we should use an Aero No. 1 for shots of things on the ground, as this filter was developed especially for the purpose of cutting out the bluish haze that generally obscures things from above; for scenes of cloud-formations, or other planes, either the K-2 or the K-3 should be used, depending, of course, upon the exact effect that we want to get: if we want the dark skies and sharply-defined clouds, etc., that we see in films such as "Hell's Angels", the heavier K-3 is the filter to use.

The best lens for most aerial work is the ordinary one-inch lens with which most cameras come equipped. An $f:3.5$ lens is quite fast enough, for most aerial scenes will be made at stops smaller than $f:11$ (unless a filter is used.) A universal-focus, or fixed-focus lens is quite an advantage, for this sort of thing is always, or nearly always, shot at the infinity focus anyway—and if your lens is rigidly fixed at that point, you can forget the matter of focus, and concentrate on the other more important matters. Once in a long while a telephoto lens may be useful;

but in most cases anything bigger than a two-inch lens is of little value. If you are shooting toward the ground, your telephoto lens will bring things too close, and not only lose the effect you want, but very likely give you a blurred picture, because of the plane's high speed. Besides, it will magnify the slightest movement of either the plane or the camera, and give you a jerky, unpleasant picture that is worthless. The same holds true if you are photographing other ships in the air, and here there is the added disadvantage of the difficulty you will find in locating your subject through the finder, especially the multiple-masking types used on some of the newer cameras.

In the actual photographing, the most important point is to hold the camera firmly in your hands without trying to brace it on any part of the plane. For if you try to brace it on the plane, you will find that the vibration of the engine will be passed on to the camera, and the result will be a jumpy, blurring picture. Another important thing is to hold the camera steady: don't try to pan around—let the plane do that. This is particularly important if you are trying to photograph several other planes in the air near you, as in military formations, etc. If you find that you cannot include all of them in your picture at once, make up your mind which you want to have in your picture, and then keep your camera trained on them, without any attempts to swing over to the others.

If you are flying in an open-cockpit plane, use the rear cockpit if you possibly can. If you have an experienced pilot, he can fly the plane quite as well from the front as from the rear—and if he isn't experienced, you have no business to be flying with him. In a flying-boat, on the other hand, the forward cockpit often gives you the best range of view. In any open plane, however, it is vitally important to be sure that you have an adequately large windshield in front of you, for the slipstream—the hundred-mile-an-hour blast from the propeller—will otherwise whip the camera around in spite of all that you can do, and spoil your picture, if it doesn't blow the camera entirely away from you. Even with a good big windshield you will find it necessary to keep well down, and to be sure that every bit of the camera is well within its protection. Even a small part projecting into the slipstream is enough to give you a shaky picture.

In a closed or cabin machine, of course, you don't have this to contend with. On the other hand, in some cabin types you will find yourself confronted with windows of tinted shatter-proof glass which can't be opened. In that case, you will be forced to do various things to partially offset the disadvantage: if the window is merely the poorer type of unbreakable glass, with yellowish, wavy celluloid imperfectly bonded between two sheets of ordinary glass, you will simply have to hunt about until you can find a place that will present the fewest of these flaws; if the glass is of good quality, but merely tinted for the comfort of the passengers, you will have to make allowance for it in the exposure and filtering. In most of the better types of private cabin planes, however—such ships as my own Travel Air, for instance—the windows are of the finest quality shatter-proof plate glass, and, moreover, some or all of them may be opened. At the very least, those beside the pilot's seats will open, giving you a clear shot from straight sideways to at least $\frac{3}{4}$ forward—and sometimes even straight forward. In that event, of course, your work is very simple: simply arrange to sit up there beside the pilot, open the window at the proper time, and shoot. I have often managed to shoot scenes this way when I was flying myself: if I had no companion to whom I could pass the controls for the moment, I would level

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The Amateur Professional

by **JOHN C. FARDON**

Basic Science Laboratory, University of Cincinnati

SINCE the glorified professional often enters the realm of the amateur, the author deems it no less justifiable for the lowly amateur to mimic the professional method. Though there is a difference of 19 and even 64 precious millimeters (to say nothing of temperamental performers and carpenters) between the professional and the amateur, much can be done with amateur equipment. With a little application and serious thought the author has advanced from the cinematography of "cute babies" (in arms) to the lap-dissolve, multiple exposure, micro-cinematics, miniature sets, make-up, matte-box with effect mattes and filters, and the follow-up shot. And last but not least, several productions have been made, in spite of the fact that the scenario was not strictly followed during the heat of the dramatic business. But since this is all commonplace knowledge to the professional, we shall get down to a little technical material which may prove to be of some interest to the "professional amateur".

The author's pride and bromide burner is the slightly modified Bell & Howell 70-D-A camera with the additional film reverse mechanism. The other added fixtures are:—the adjustable matte-box, camera track for centering the field for close-ups, auxiliary view finder, and the automatic dissolve disc. In Figure 1 we see a close-up of the camera that was once portable but is now only movable. As a result of the professional embellishments the camera and tripod were mounted on a stand with rollers, as shown in Figure 2, thus making possible the follow-up shot. Referring again to Figure 1, we see, directly behind the matte-box, the dissolve disc which is



Fig. 2



Fig. 3

supported by an adjustable upright. A flexible steel cable transmits the power of the spring drive motor to the celluloid disc. The ratio of the driving pulley to the driven pulley on the disc is such as to allow one foot of film to pass for a fade-out or lap-dissolve. A stop and spring release lever on the disc is such as to allow one foot of film to pass for a dissolve the release lever is depressed, thus setting the disc in motion. After a half revolution the disc automatically stops and the operator releases the camera button. With the aid of the reversing mechanism the film is backed up a little over one foot (about three turns of the crank). Then the camera control button and disc release lever are operated simultaneously, thus effecting a fade-in to complete the lap-dissolve.

As for the disc proper, it was made from a 5x7 process film cut in a circle of four inch diameter. After numerous attempts at making a circular optical wedge by various procedures, the author finally came upon a method which produced remarkable results. A simple bar pendulum of about sixteen inches in length with a metal disc of six inch diameter fastened to the pendulum was mounted as shown in Figure 3. The center of the disc is directly in line with the fulcrum of the pendulum. A small sector was cut out of the disc in order to permit light to pass through and impinge upon the film, which was mounted on a square board directly behind the disc. In order to produce the variable density upon the film, the apparatus was set up in a dark-room, with a 10 watt lamp placed about seven feet from the disc. The pendulum was then set in motion and the lamp turned on. As the oscillations of the pendulum decreased to zero, the lamp was switched off and

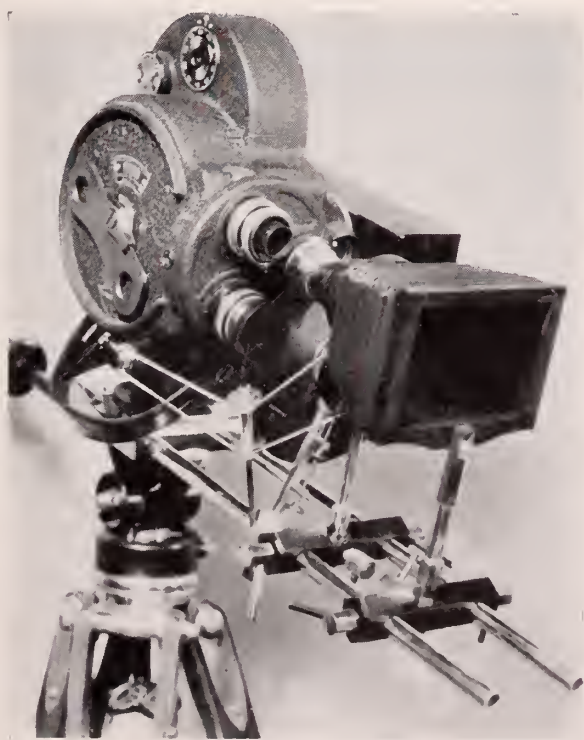


Fig. 1

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A Standard Aperture

(Continued from Page 14)

only as a makeshift, for the cameramen have had to fill about twenty per cent of their frame area with non-vital action or unessential views of the set.

To rectify this condition, the A.S.C., the Academy, and the various other interested groups have cooperated in devising a new aperture. This new aperture restores the desirable 3 x 4 rectangle, and is to be used for all purposes including the now rare disc and silent versions. As the diagram shows, it provides for a projection aperture slightly smaller than the camera-aperture. The dimensions of the photographing aperture are .651" x .868". The dimensions of the projection aperture are .615" x .820". These standards have been officially recommended by the various agencies involved in their development, and will soon have been standardized by all of the major producing and exhibiting firms, which will, naturally, compel the smaller independents in both fields to follow suit. Although the new standard has been announced only a short time, it has already been adopted by the Metro-Goldwyn-Mayer studio and is in use on all of the productions now in work at that plant. The Paramount Studio is also adopting the new aperture, and a majority of the other major firms are either preparing to make a similar change or seriously considering doing so. A full report of the proposal has been forwarded to all studio executives by Lester Cowan, Executive Secretary of the Academy. The studios have been asked to make their decision by November first. The proposal will next be referred to the principal theatre chains, and thereafter a definite date will be set after which all productions will be photographed with the new aperture.

Its adoption will be of far reaching benefit. The first to feel it will naturally be the cameramen, who will no longer be forced to compose simultaneously for a variety of apertures and proportions. The other production departments will, in consequence, be benefited. The design, construction, and lighting of sets will be vastly simplified. The tops of large sets can be lowered by as much as five feet, and all sets can be reduced in width by nearly ten per cent without making any change in the placing of the essential action and props as photographed for the past year. Scaffold lights can be lowered from three to five feet, thus making possible either a reduction in wattage or the use of fewer units. Microphones can be lowered from three to five feet, resulting in an obvious advantage in sound quality and convenience for the sound department.

The studios will be assured that their pictures will be projected exactly as photographed. The exhibitors will be able to standardize their projection equipment with the assurance that they will be able to play the product of any producer without danger of bad projection due to misframing and conflicting apertures. And the public will get the best visual quality that the producers and exhibitors can give it, combined with the soothing psychological effects of the easy-to-look-at 3 x 4 rectangular picture. In a word, we have taken another step in our return to the photographic normal.

Milestone Plans Off

Lewis Milestone and David Selznick, who planned to produce for Radio release, have dropped their plans, it is reported. Selznick may go to Radio as executive and Milestone will probably return to the Howard Hughes organization.

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Making Miniatures

(Continued from Page 10)

phenomenon. Many times I have seen miniature scenes which, in the first few-score feet, while the camera was gathering speed, looked sharp and "miniature", suddenly soften out and become natural as the camera reached the proper operating-speed.

The successful miniature-photographer must also be familiar with all of the various special photographic processes. By means of such processes as the Dunning or Williams' processes, or by the use of projected action he can combine the miniature with previously photographed action or backgrounds and so add realism through the addition of people or other natural action. Optical printing also is an invaluable aid, as it enables us to combine any number of separate shots into one complete one. By this method we can often advantageously use miniatures to supply foreground or background action in normal scenes made in the stage or on location.

Therefore it can be seen that the secret of success in miniature work—if so obvious a fact can rightly be called a secret—is intelligent and experienced design, painstaking and artistic construction, and thorough cooperation between the designer and photographer in the ultimate process of photographing the miniature. The ultimate goal is perfection, not as an artful model in itself, but as a means toward making a completely realistic shot more efficiently, and with less expenditure of time and money, and less danger to human life, than would be involved in doing the same thing in actuality. It is not a question of fooling the public, but one of giving them a better show for their money by taking advantage of this method, which simplifies the difficult, and makes the impossible possible.

Mr. Jahraus is one of the best-known and most experienced miniature technicians of the industry, having specialized in this work for nearly twenty years. He has the distinction of having made the first miniature used in motion pictures.—H. H.

16 mm. In The Air

(Continued from Page 40)

the ship with the adjustable stabilizer, take my hands off the wheel, and shoot my scenes while the ship flew itself—as most modern ships will under normal conditions.

The forward position, beside the pilot, is generally the best camera position in private, single-motored cabin planes. In commercial airliners, of course, whether single-motored or otherwise, this position is out of the question for most of us: so the next best is the extreme rear seat—especially in trimotored machines, where you would otherwise get a picture only of the engine-nacelle, landing-gear, and wing-bracing. The windows in these machines are generally of excellent glass, and quite easy to photograph through even though you can't often open them. The pilots on most air-lines are very accommodating fellows, and will be glad to help you to get good pictures of interesting scenes on the run if you will only ask them to before you start. I have often known them to go several miles out of their way in order to circle some particular place that a passenger had wanted to see, and to drop down to an altitude of 1000 feet or less—ideal for photographing—in order to give the passenger the best possible break.

As a rule, I think that the best results will be obtained if you have flown once or twice at least before trying to use your camera: then you know what to expect—how things look from the air—and you can concentrate on your camerawork without thinking of the novelty of flying.

Granted a good pilot and a modern airplane, flying is **safe**. It is also a wonderful sport in itself; and since it gives us not only a chance at rare sport in making the pictures, but pictures that are in themselves interesting, not alone to ourselves, but to everyone else, none of us should neglect a chance to take our cameras a-flying with us.

Hollywood Callboard

As this issue goes to press the following production activities were under way in the Hollywood Studios.

STUDIO	STAR	DIRECTOR	ASST. DIR.	CAMERAMAN	STORY	SCENARIST
COLUMBIA	Jean Harlow Jack Holt Barbara Stanwyck Buck Jones	Wm. Beaudine Edw. Sedgwick Frank Capra L. Hillyer	Jean Anderson Dave Selman Buddy Coleman Mack Wright	Teddy Tetzlaff Con O'Connell Archie Stout	"Blonde Baby" "Yellow" "Forbidden" "Justice Rides Again"	Robt. Riskin H. J. Green Uncredited L. Hillyer
CARR STUDIO	Bob Steele	Bert Glennon	Paul Malvern	Archie Stout	"Law of the West"	Bert Glennon
DARMOUR	Mickey McGuire	J. A. Duffy	Wesley Morton	Jim B. own	"Mickey's Peace Conference"	Uncredited
FOX	Farrell-Gaynor	David Butler	Ad Schaumer	E. Palmer	"Delicious"	Bolton-Levine
INTERNATIONAL STUDIO	Action—All-Star Fanchon Royer Big 4-King-All Star Fenix Prod.-Bohr	Frank Strayer Wallace Fox Unassigned Geo. Crone	Art Black Alfred Benham Wm. Nulte Art Black	Jules Cronjager Ernie Miller Eddie Kull Harry Jackson	"Flop House" "Gangway" "Dance Hall Kisses" "Hollywood, City of Dreams"	Betty Burbridge Bern. McConville J. P. Reed Mig. de Zarrayhia
METRO-GOLDWYN-MAYER	Greta Garbo Marie Dressler Shearer- Montgomery	Geo. Fitzmaurice Clarence Brown Sidney Franklin	H. Tate Chas. Dorien Harry Bouquet	Wm. Daniels Oliver Marsh Ray Binger	"Mata Hari" "Emma" "Private Lives"	Uncredited Vicki Baum Kraby-Shyer-West
PARAMOUNT	Dietrich-Brook- Wong Cooper-Coogan Sidney-Raymond Chatterton-Lukas- Ames All-Star All-Star Boyd-Francis-Tearl	Josef von Sternberg Norman Taugog Marion Gering Richard Wallace Dorothy Arzner Ernst Lubitsch Stuart Walker	Ned Marin A. Jacobson Geo. Yohalem Sidney Brod Wm. Kaplan Geo. Hippard Jack Mintz	Lee Garmes Arthur Todd David Abel Chas. Lang H. Fischbeck Victor Milner Henry Sharp	"Shanghai Express" "Sooky" "Ladies of the Big House" "Tomorrow and Tomorrow" "Working Girls" "The Man I Killed" "The False Madonna"	Jules Furthman Jones-McNutt L. Weitzenkorn Josephine Lovett Zoe Akins Vajda-Raphaelson Kober-Harris
R.K.O.-PATHE	Helen Twelve- trees	Ralph Murphy	Robert Ross	Arthur Miller	"The Second Shot"	Garret Fort
RADIO PICTURES	Dolores Del Rio Astor-Cortez	Herbert Brenon Geo. Archain- baud	Ray Lissner Tommy Atkins	Nick Musuraca Leo Tover	"The Dove" Untitled	Stevens-Meehan Louis Stevens
TEC-ART	B. F. Zeidman Prod. Patrician Pictures Supreme Features Mascot Pictures	Howard Higgin Alan Crosland J. P. McCarthy Watson-Schaefer	Clem Beau- champ Geo. Bertholon Harry Christ Webster-Tyler	Al Seigler Bob Plank Frank Kesson Ben Kline	"Juvenile Court" "Thirty Days" "Cavalier of the West" "The Lightning Warrior"	P. Gangelin Hal Conklin J. P. McCarthy Gittens-Beebe
TIFFANY PRODUCTIONS	Wallace Ford Maynard-Hiatt	Erle C. Kenton Breezy Eason	Doc Joos Mike Eason	Gill Warrington Arthur Reed	"X Marks the Spot" "Sunset Trails"	Florence Ryerson Ben Cohn
UNIVERSAL CITY	Bela Lugosi Summerville-Pitts	Robert Florey T. Freeland	Scotty Beal Alfred Stearn	Karl Freund Jerry Ash	"Murders in Rue Morgue" "Pudge"	Florey-Van Avery Uncredited
WARNER BROS.-1ST NAT'L	Lil Dagover Winnie Lightner Fairbanks-Blondell	Michael Curtiz Lloyd Bacon Alfred E. Green	Joe Barry T. C. Wright Al Alborn	Ernest Haller Dev. Jennings Sol Polito	"The Captain's Wife" "Manhattan Parade" "Union Deoot"	Thew-Mandel- stamm Lord-Branch Nicholson-De Leon

In the Art Director's Field

With this issue we introduce a section devoted to the Art Directors. In this section will be found news notes and technical articles of interest to anyone connected with the making of motion pictures. From time to time we will introduce the men who design and create the settings that mean so much to the success of the pictures. In this issue we present William Darling of the Fox Studios.—Editor's Note.

William Darling



TO BE A successful Art Director, one must be a combination of artist, architect and mechanical draughtsman.

Apparently, William Darling, art director of the Fox Film Corporation, must possess these qualities, for his work for Fox stamps him as one of the motion picture industry's finest art directors. Mr. Darling has devoted his life to the acquiring of his knowledge, and is a prof and student; declaring that only by constant study and research can an art director hope to create settings that will be artistic, virile and absolutely correct in detail and style.

William Darling is a name this man acquired after he came to America. He was born in the little town of Sandorhaz, Hungary, and was baptized as Vilmos Bela Sandorhazi. But when he came to America he felt that that was almost too much for the ordinary man to pronounce, so had his name legally changed to William Darling, so that his associates might tag him with the name, "Bill", if they so desired.

He was an artist by instinct from childhood. He inherited his ability, for his father and mother were both painters in their leisure time. They encouraged their son and sent him to the University of Architecture at Budapest. His ability as a painter won him a scholarship at the Hungarian Academy of Fine Arts. Then followed years of roaming the highways and byways of the world, studying people, customs, architecture—

life. Unknowingly, he was fitting himself for his present position, for the knowledge he gained in those years has been invaluable in designing sets with foreign locale.

During the World War he served his country—and that experience stamped itself indelibly on his mind and when he re-created the blasted countryside for "What Price Glory?" he was calling upon his own experience and first-hand knowledge.

It was shortly after the Armistice was signed that he came to America. He had made one previous visit here. He earned his living by painting portraits of notables along the Atlantic seaboard. But, California was calling him, and he eventually went to Santa Barbara where he became interested in the work of the American Film Company. He joined their art staff, draughting sets and designing scenic backgrounds. His work at once attracted attention in the film industry, and when Fox Films decided to make the screen production of "Monte Cristo", Darling was sent for. That colorful production was his introduction to Hollywood, and he has been under contract to Fox ever since.

During his years with Fox Films he has created hundreds of sets, ranging from modern peasant dwellings to medieval castles, from desert strongholds of the Foreign Legion to the latest thing in night clubs. And realism prevails in his work. So realistic are his settings that many foreign "extras" have been known to fairly haunt his sets where they find the atmosphere of the homeland.

Darling has a certain daring in his work, best exemplified by his sets for "Mother Knows Best". He decided to dress one of those sets in the then new modernistic furnishings. It was the first time in motion pictures that a set had been given such treatment. The result was sensational. Darling was right. He had figured such treatment would be in harmony with the action and would assist in the dramatization. Harmony and symmetry, says Mr. Darling, are keynotes in motion picture production.

"There is no art requiring so many heterogeneous elements as the motion picture," says Mr. Darling. "Take for example, the writers, actors, costumers, cinematographers, and the directors—they are all responsible for the ultimate success of the production. They must all work in harmony or the results will not be right. If the cameraman does not light a set properly the objective of the art director will be lost. If the costumer does not provide the proper colors and details an entire sequence will be made ridiculous—for can you picture a foreign set, perfect in detail, with the characters dressed improperly?"

"As in motion picture photography, the cameraman must know the atmosphere of the story so he can properly light it, so must the art director know and feel the atmosphere so he may create the scenic backgrounds to bring out this atmosphere. Art direction is something more than a mechanical carrying out of certain detail. An art director must be a creator. He must be a dreamer, but still practical, so that he can place in the studio those dreams that we call sets."

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General Theaters Equipment Reports \$883,353 Profit

NET INCOME of \$883,353.70, applicable to the preferred and common stocks, is reported by General Theatres Equipment for the six months ended June 30. Net sales and other revenue of the company for the period amounted to \$6,235,149.85. The net does not quite cover the dividend requirements on the \$3 preferred stock.

The Amateur Professional

(Continued from Page 41)

the film developed in contrast developer, the result being a circular shaded area as shown in Figure 4. It is necessary to

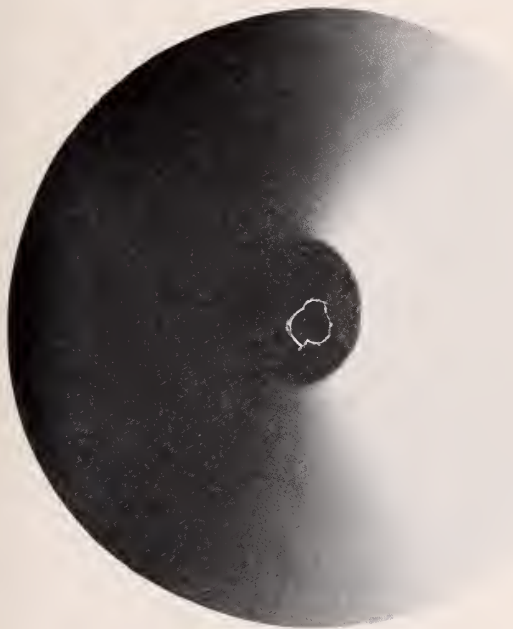


Fig. 4

use a source of D.C. to illuminate the lamp; otherwise a stroboscopic effect is produced which betrays itself by a series of radial spokes on the developed film.



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Greenbrier Hotel Installs 16 mm. Projection Room for Amateurs

ADDITIONAL link in the chain of ever increasing popularity of amateur movies, the famous Greenbrier Hotel at White Sulphur Springs, W. Va., has equipped and opened a 16 mm. theatre for the exclusive use of its guests and their children.

During the spring and autumn seasons, hundreds of the socially elite come to this noted health resort, the greater majority bringing with them their movie cameras to record in a permanent living picture, the manifold joys of the numerous sports and other attractions the resort has to offer. Golf, horseback riding, swimming, mountain hikes and archery are just a few of the subjects the notables train the lenses of their cameras on, to say nothing of the truly marvellous scenery which literally devours thousands of feet of film. But—the majority of these movie makers usually spend weeks, sometimes months at a time at the hotel and heretofore have been unable to see the result of their efforts until they return home—now, with the innovation of the 16 mm. guest theatre, the hotel management has hit on an idea which is a boon to those guests with a movie penchant.

Recognizing the ever increasing popularity of amateur movies and realizing the need for a miniature theatre for the convenience of his guests, Mr. L. R. Johnston, general manager of the Greenbrier, himself a keen amateur, converted a centrally located space in the hotel into a complete and up-to-the-minute projection theatre. Fifty feet long and sixteen feet wide, with a seating capacity of sixty persons, the theatre is the last word in comfort with its hanging draperies of red velour and comfortable arm chairs. Here the guest may take his films and his friends and with the help of an experienced operator, see what his results are.

Tobis Cuts Prices

THE FRENCH Tobis company announces new prices on sound equipment. In future production apparatus will cost \$3,830 instead of \$7,255 while projectors for small theatres will be sold at \$2,925.

The Hollywood Camera Exchange

WHILE cries of depression are heard from all corners of the country, there is one spot in Hollywood where the word has no place. It is at the Hollywood Camera Exchange. Cliff Thomas, President, and C. G. McKie, Treasurer, wear boom-time smiles, and say there is no such word as depression in their lexicon.

This Hollywood Camera Exchange has shown remarkable growth in the brief time since it was organized. Art Reeves and Thomas started it. And after it had developed into one of the busiest spots in Hollywood Reeves sold part of his interest and started the Hollywood Motion Picture Equipment Company, dealing in sound and laboratory apparatus. When Reeves left, C. G. McKie came in as one of the officers. Mr. McKie, formerly with the Roy Davidge Film Laboratories, has had much experience in the photographic supply business. For years he was with F. J. Falman Company in El Paso, Texas, as business manager.

In addition to the tremendous camera rental business, and the selling of all kinds of supplies for the professional, the Hollywood Camera Exchange has gone deeply into the Amateur field. Everything for the Amateur is on hand, and both Mr. Thomas and Mr. McKie cordially invite all amateurs to call when they visit Hollywood. At the Hollywood Camera Exchange the amateur cinematographer has the opportunity of meeting the professional and exchanging ideas or obtaining advice. "We want the amateurs to make this their headquarters", says Mr. Thomas, "We are always ready to give them the benefit of our professional experience."

Amateur Movie Making

(Continued from Page 34)

majority. Furthermore, no picture—no matter what its genre—can be called a finished production unless the idea motivating its maker—in other words, its story—is completely realized. This realization naturally includes something of story construction, direction, editing, and titling as well as merely cinematography. Therefore, the would-be entrant to this competition will do well to assure himself that he has an understanding of the basic principles of all of these phases of production and that his film bears this out—before deciding that his film is complete. In order to aid in this respect, this department will for the next few months devote itself exclusively to one of these subjects each month. In the meantime, let me suggest that both the 1930 and the 1931 editions of the **Cinematographic Annual** will prove invaluable reference works to those intending to produce films for the competition. You may not be able to follow in detail the methods outlined by the various outstanding professional technicians in their articles in these books, but you cannot but be aided in your efforts by absorbing the ideas they set forth.

Star Chasing A Business

YOU HAVE probably heard of "star-chasers," but we doubt whether you ever knew before that there is a man in Hollywood who makes a living from this mad pursuit. This person is Ralph Staub, who produces "Screen Snapshots" for Columbia, and he gets most of his intimate scenes in the lives of the stars by following them around with a movie camera and catching many of them off guard.

Ralph has been busy these days at Malibu, trying to catch the notables at play along the beach, but they often elude him and swim out to sea to escape the camera. Ralph is hoping that some day one of them will get a cramp while he has his camera, so that he can record a real rescue that wasn't written in the script.

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THE AMERICAN CINEMATOGRAPHER

Another Free Victor Film Directory

THE 4TH Revised Edition of the Victor Directory of Film Sources is announced by Victor Animatograph Corporation as being ready for distribution.

Publication of this edition has been somewhat delayed because of the rapid development in the Sound field and the desire of the Victor Animatograph Corporation to have the Sound listings as complete and as authentic as possible before incorporating them as a regular part of the directory.

The 4th Edition is even more replete with valuable information for the 16 mm. equipment user than the previous three issues.

Included in the additions to the editorial contents of the directory are: "What kinds of Films do the Churches Want?" "What Educators have learned about Educational Motion Pictures", "Average Purchase Prices and Rental Rates on all Types of 16 mm. Films", "Sound Recording—Methods and Costs", "What About 16 mm. Sound," and much other useful information.

The Victor Directory has so adequately filled a long felt need among equipment owners that the demand for it has become tremendous. The listings are surprisingly complete and comprehensive. A large percentage of recipients retain it for constant reference, and this is particularly true in the school and church fields.

The Directory lists over 250 sources of free loan subjects, and virtually all known production, sales and rental sources.

The Victor Animatograph Corporation, manufacturers of the well known line of Victor 16 mm. Motion Picture Equipments, has won many new friends and has been highly praised because of the unselfish spirit of service which actuated the compilation, publication and free distribution of the Film Source Directory.

A copy of the 4th Revised Edition may be obtained by addressing the Directory Editor, Victor Animatograph Corporation, Davenport, Iowa.

Roach Installs Double Director Shorts Units

FOLLOWING the resignation of Warren Doane as general manager of Hal Roach studios, recently, Benjamin W. Shipman was appointed to fill the berth. He will also retain his position as legal advisor and business manager.

L. A. French becomes assistant gen. manager and retains his position as purchasing official.

A system of alternating direction goes in at Roach, starting on the next cycle of pictures. Under this scheme, two directors will be assigned to each unit, to work alternately, with one preparing while the other is shooting.

Warren Doane and James Horne will be the alternating directors on the Charles Chase unit; Robert McCowan and Ray McCarey on the "Our Gang" pictures; Gil Pratt and R. C. Currier, former cutter, on the Pitts-Todd series with Morrie Lightfoot co-directing with each, and George Stevens and Anthony Mack will share direction on the "Boy Friends" group.

This means that Roach will be entirely without a scenario department, W. M. Walker, present head, carrying out his job without a staff. Some of the writers directing for the first time are on trial, according to the studio.

B.T.-H. Plans to Enter 16 Millimeter Field

B.T.-H., one of the leading electrical firms of the world, which has installed 600 talkie sets in the British Isles, is preparing to make 16 mm. talking pictures. The company will not produce itself, but will concentrate at present on reproducing existing pictures on the narrow film. It has designed and is using a machine for reducing 35 mm. films to 16 mm. It weighs about 60 pounds and will be sold well under \$1,000, the price to vary with the demand.

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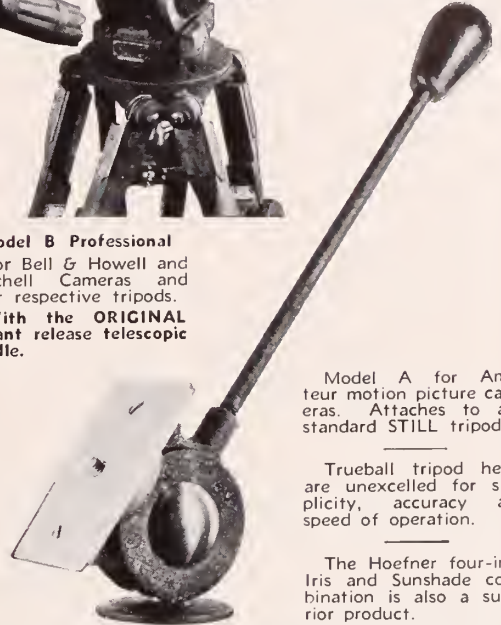
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Lucien Le Saint Dead

LUCIEN LE SAINT, pioneer of the French film trade, is dead at 50. He was responsible for some of the earliest discoveries in regard to the motion picture camera. For the past three years he had been blind.

50 Bauer Sound Sets for Belgium

FIFTY Bauer sound reproducing sets were installed in Belgian theatres during the summer. This is believed to be a record for a single make of sound apparatus in Belgium. It is a German sound-on-film set.

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New Model Animatophone

THE ANIMATOPHONE 16mm Talking Projector, which several months ago caused such a sensation with its Vertical Turntable and other unique embodiments, has been made even more attractive, compact and efficient through the acquisition of a "blimp" type case which encloses the projector while it is in operation.

Another major improvement is a vertical tone-arm which operates on the pendulum principle.

It is an interesting fact that the very first units of the "Blimp" Animatophone to be manufactured were initially demonstrated before officers of the U. S. Navy Recruiting Service, with the result that 36 complete units are now in use in Navy Recruiting Stations thruout the country.

The design of the "blimp" case is such that the turntable is attached from the outside to the shaft which protrudes thru an opening in the side.

Access to the projector for threading, focusing and adjusting speeds is gained by opening the right hand side of the case, which is hinged at the bottom.

During operation the case is closed and the picture is projected thru a slot in the front. Thus, the sound of the projector motor and film movement are rendered practically inaudible.

The new Animatophone is much more compact, has smaller case dimensions, and several pounds have been removed from its weight.

The vertical tone-arm is a radically new idea, and is completely characteristic of A. F. Victor inventions. It is extremely simple in principle and construction, yet it accomplishes its purpose in a highly gratifying manner.

This is believed to be the only pickup in use which reproduces sound on the same principle that is employed in the original recording of the record.

Inasmuch as the needle retains relatively the same position in the grooves, laterally and vertically, from the very beginning to the end of the record, it eliminates entirely the distortion which is so common to other types of pickups when the needle is in the extreme outer or inner grooves of the record.

The tone-arm proper is pivoted from the top of a rocker-arm. As the needle is advanced by the record groove, the tilting of the rocker-arm compensates for the lateral movement of the pickup head and keeps the needle on a straight line across the record. The pendulum principle employed in the pickup keeps the needle constantly at right angles to the line of travel.

It is said that this feature offers a tremendous advantage, in that the needle is kept always parallel to the record groove and rides perfectly in the original recording track. The claim is that this results in a more natural and perfect reproduction, and, at the same time, is decidedly less damaging to the record groove.

A push-pull Pilot Light to aid in properly setting the needle on the record is among the several other new features on the "Blimp" Animatophone.



Woolf Out of Multicolor

J. C. WOOLF, who, up to September 30, was sales manager for Multicolor, Ltd., has been made vice-president and general manager of the Los Angeles Wild Animals Farm, Inc., located on the grounds formerly used by the Hollywood Polo Club, on Ventura Boulevard.

The entire Selig Zoo has been purchased and moved to the new quarters, and will form the nucleus of the animal project.

It is the purpose of the farm to breed, raise or buy every type of wild animal that can be reared in captivity, so that there will be available every sort of animal necessary for the use of picture producers.

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AN EVEN HUNDRED highly endorsed 16 mm. educational films have just been added to the Bell & Howell film library, marking a notable advance in the number of worthwhile motion pictures available for school use.

These films represent most comprehensive collaborative work on the part of a large staff of expert cameramen, travelers, explorers, scientists, and educators; and more than three million feet of negative has been drawn upon in assembling the subject material.

Forty-two of the subjects relate to science and nature, and six are listed under what is called the American Statesmen Series, each film of this series being devoted to an outstanding national character such as Washington, Franklin, Jefferson, and Lincoln. Thirteen subjects have to do with as many literary notables or their works, and in this group are films on Poe, Holmes, Irving, and other famous writers.

Nine films are given over to geographical subjects and seven to industry and agriculture. Among the other films are eight on outdoor life and a five-reel picture on the Life of Christ.

Dr. Raymond L. Ditmars, Edward J. Foyles, M.S., Henry R. Linville, Arthur H. Graves, Ida M. Mellen, and others prominent in educational or research circles, have either cooperated in the preparation of the films or have expressed marked approval of them.

An idea of the interest value and picture excellence of the films is obtainable from the fact that a number of them have been appearing in new sound versions as a part of the regular program of the famous Roxy Theatre in New York.

All of the hundred subjects are now available in 16 mm. silent versions in film lengths of approximately 400 feet per reel. Synchronized sound discs are being prepared on a majority of the subjects to permit of sound presentation, and some of these discs are already completed.

Acquire Hudson Lab.

ACQUISITION of the Hudson Film Industries laboratory at Palisades, N. J., is announced by International 16 mm. Pictures, Inc. Capacity of the plant, now figured at 1,500,000 feet per week, will be increased to 4,000,000 feet per week. Only 16 mm. film will be handled at this lab. Negotiations are also under way for a second laboratory at which both 35 and 16 mm. film will be treated.

Doug to South America

DOUGLAS FAIRBANKS plans an airplane trip in December to South America in company with Victor Fleming, director, and Charles Lewis, actor. They will take cameras and sound equipment for the making of a picture on their journey, which is expected to take them down to Chile, across to the Atlantic coast and then up to the headwaters of the Amazon.

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Blacklisting English Exhibs

THE KINEMATOGRAPH Renter's Society, London, on the advice of the joint investigation committee of that distributors' organization and the Cinematograph Exhibitors Ass'n, will stop renting pictures to those exhibitors who have not lived up to agreements on sharing terms. Five exhibitors have been banned. The ruling is now in effect and the banned exhibitors will be forced out of business, it is stated.

Gaumont-British Theaters Show Increased Profit

GENERAL THEATERS Corporation and Denman Pictures Houses' third annual report shows a net profit for the year of \$1,679,295. Gaumont-British holds the whole of the ordinary shares in General Theaters and most of the Denman Picture Houses' capital.

A Cinematographer In Sweden

(Continued from Page 13)

Swedish films—particularly talkies—is limited, they have a surprisingly modern plant. They still use the old-style glass stages, and, unlike most of our producers, instead of spending a great deal of money for sound-proofing them, they have merely surrounded their sets with heavy monk's-cloth drapes, which deaden the unwanted reverberation quite satisfactorily. Their technical equipment is largely German: Tobis-Klangfilm recording, Askania cameras, and a variety of German lighting units. When we visited them, they had not yet adopted the microphone boom, but were still planting the "mike" in the set, behind props. They had, however, just completed the installation of an excellent machine-development laboratory, and this, together with a recent change to the use of American film, has resulted in very excellent photographic quality in their productions. Although our own work gave us little time for theatre-going—we worked or travelled sixteen to eighteen hours per day—we did manage to see several Swedish pictures. They were technically and dramatically excellent—unusually so when one remembers the very limited production possible. It was particularly interesting to us to note that since the Swedish Film Industry is largely controlled by the government, many of the films contain a good deal of both direct and indirect propaganda directed against the activities of the Communist and Fascist parties, and praising the existing regime.

From the American Cameraman's viewpoint, another fortunate thing is that all educated Swedes speak English; the Swedish educational system is excellent, and all pupils are rigidly required to master both English and German before they can wear the picturesque, white "student's cap" which signifies that they have graduated from highschool—or, more correctly, passed the "Studentexamen," which somewhat corresponds with our College Board Examinations. There is, however, a difference, for to fail in this examination is considered a lasting disgrace, for without the prized student-cap there can be no future for any except the laboring class. These white-capped students, however, are a godsend to the traveller, for one can always be sure that the wearer of such a cap will not only understand English, but be more than glad to assist you.

As a cameraman, moreover, I found everyone eager to be of aid, for the Swedes are proud of their country, and everyone, rich or poor, great or humble, is willing to go far out of his way to assist in making pictures that will tell the world more about Sweden. Therefore, it is a pleasure to make pictures in Sweden: for what more can a cameraman want than a beautiful country, quaint customs and unusual places to photograph, and a friendly, hospitable people to work with?

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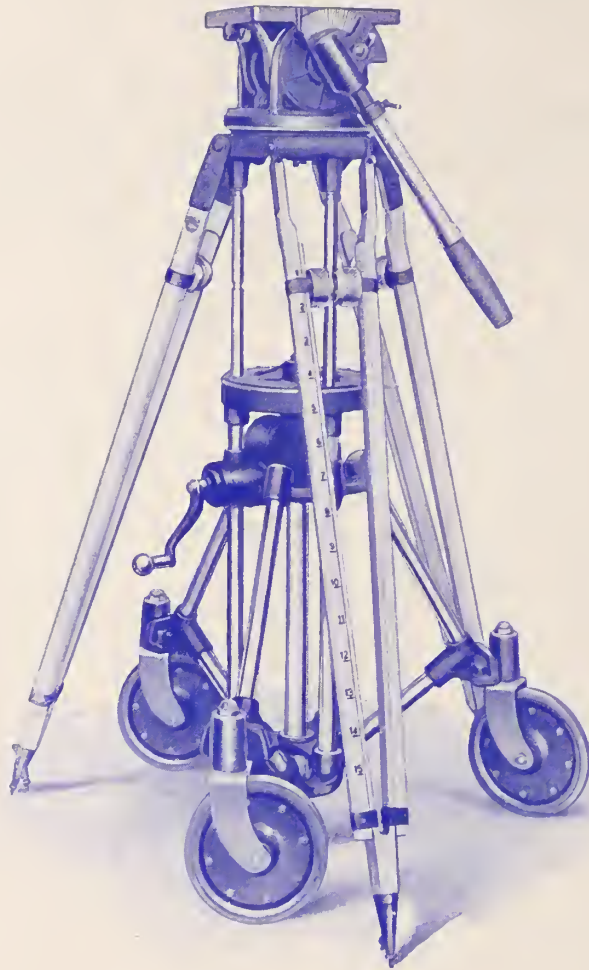
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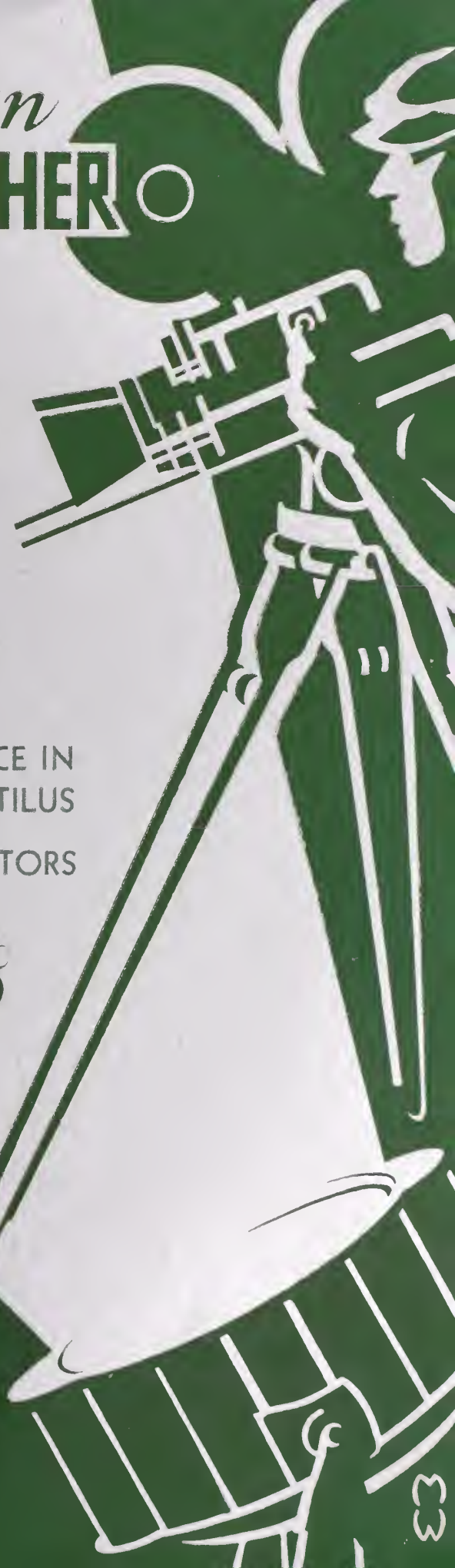
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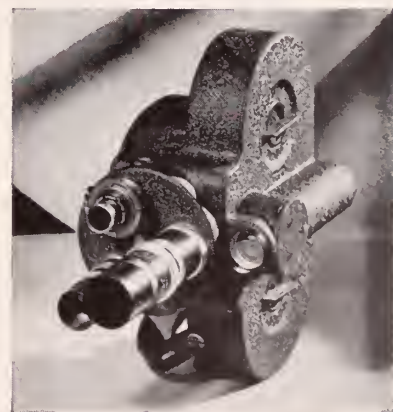
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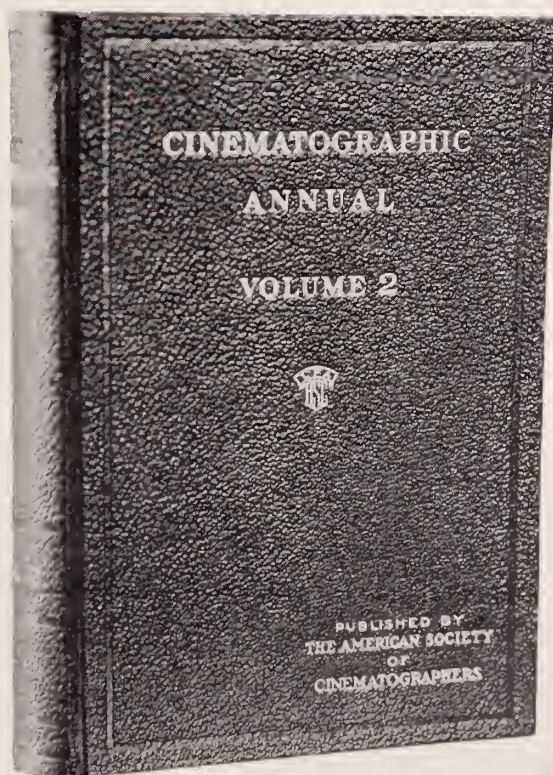
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UNDER THE POLAR ICE IN

by JOHN DORE

Paramount Sou I

● When an entire world was waiting anxiously last summer for word of either the failure or success of Sir Hubert Wilkins in his attempt to reach the North Pole in a submarine, far beneath the great mass of Polar ice, there was a Cameraman, as usual, in that little vessel. A Cameraman, fearless, enthusiastic, ready to give his life, if need be, to bring back photographic records of the feat that had a world on edge. The cameraman was Mr. John Dored, member of the American Society of Cinematographers. Here we present to you Mr. Dored's rather modest account of the adventure. With his characteristic modesty, Mr. Dored suggested that someone had better rewrite it as he felt that he was not a writer. That would be a shame, for Mr. Dored has given us a word picture, the excellence of which lies in the fact that it lacks ornateness and floweriness of phrasing.—The Editor.

THE BEST and only season for Arctic explorations are the summer months—June, July and August. During that time the sun shines brightly twenty-four hours a day, with the average temperature ranging from 10 to 25 degrees Centigrade above Zero; the atmosphere very clear, with no strong winds. Later in the season comes a period of dense fogs, rain, hail, snow and continual darkness.

Due to many mechanical mishaps with the Nautilus, the expedition did not reach Spitsbergen until the end of August—just at the start of the bad season. The hardships which we encountered on our way from Spitsbergen to the Polar ice fields and back were really very great. Except for a couple of sunny days, we had nothing but fog, rain, hail and heavy storms during our three weeks in the Polar field. On the first day of our contact with the Polar pack ice the diving rudder of Nautilus was cut away by a deep-sitting piece of ice. That was a terrific blow, for a submarine without a diving rudder is just an ordinary surface vessel. However, due to the skill of the submarine specialists, we made several dives under the polar ice, anyway.

Those were moments never to be forgotten—the moments just before the dives. "Chances are", said the specialists, "we

will never come up again if we make the dive." But the decision was made to try it. It was a tense moment when Captain Danenhower gave the order, "Everybody at his station for a dive." I watched the faces of the men. They looked serious, and I imagine they all, like myself, were wondering if we would ever come up again.

To photograph the under-ice pictures I took my station in the escape hatch at the Eye Port, a circular window of about four inches in diameter, and fitted with a thick glass. Through this I could see outside, and through it I took the pictures with an automatic DeVry camera while we were submerged. The escape hatch was just big enough to hold one man and a small camera without a tripod.

As soon as we started to dive I pressed the camera lens close to the window and took the pictures. I could not see what I was photographing for the camera covered the window. So it was all guess work as far as volume of light for exposure was concerned. But, I can say now that there is plenty of natural photographic light to a depth of forty feet. One can see clearly to a distance of from six to nine feet. Beyond that it is just a haze. The sight of the Polar ice as viewed from beneath is simply a thing of marvelous beauty—indescribable, unforgettable. It is like a world of fancy; the ever-changing ice formations with colorings from pure white to a deep, bluish green, with a dim background, gives the impression of an unreal dreamland. For that sight alone, it has been worth

while to live, to suffer and take all the risks.

Living conditions on the Nautilus were extremely hard. All free space was occupied by scientific instruments, Polar equipment, and food sufficient for two years. Everybody suffered from cold and dampness. Due to condensation within the



Mr. Dored on board Nautilus



Nautilus starting her homeward journey.



A view of the Polar ice pack.

THE SUBMARINE, NAUTILUS

ED, A. S. C.

News Staff Reporter

Nautilus, water was dripping from everywhere, and now and then a big sea would find its way through an open hatch while we were running on the surface. For a period of three weeks, undressing for a short sleep was impossible because of cold and dampness. The water supply for cooking and drinking became frozen, and we had to use water from a fuel tank which smelled like kerosene oil. But everybody kept on smiling and our little phonograph played "Good-night, Sweet-heart" music; and Captain Danenhower on special occasions served us with a mug of good rum.

On our way back to Spitsbergen we encountered a real Arctic storm which lasted two days. As we closed the hatches for the run through the storm we saw three huge icebergs. Our periscope became coated with ice and we could not see the surface, so we went on—full speed ahead—through the storm towards Spitsbergen. Outside was a raging storm and masses of ice threatening us momentarily, but we ran blind and made it.

How we did it without crashing into one of those mountains of ice will always be a mystery to me. I guess some guiding hand must have been watching over us, caring for us, protecting us. From the very beginning of the expedition, trouble seemed to follow good, old Nautilus, and only the courage and determination of Sir Hubert Wilkins carried the expedition through to a safe ending. Many a man would have given up when the engine trouble developed in the crossing of the Atlantic. But not Sir Hubert. Truly, there is a REAL

man and a born leader; a man whom strong men will follow into any danger. When we were about to make our first dive under the ice, with our diving rudder gone, his courage and his characteristic calmness almost made us forget the fact that we would perhaps never come to the surface again. But with a man like Sir Hubert leading you, you smilingly step into any danger.

The results obtained in the scientific field were highly satisfactory. In fact, the results were even bigger than had been hoped for or expected. All on board, naturally, were disappointed because of the delays and accidents which shortened the period in which we could carry out our work. If we could have been in the Polar waters earlier in the summer with our ship in good working condition we undoubtedly could have made sensational discoveries. I sincerely hope that Sir Hubert will be able to organize another similar expedition with a new submarine especially designed and built for the Polar work. If he does, I hope I shall be one of those on board. The experience of the first trip will stand me in good stead, and I am certain I shall be able to bring back photographic results that will be extremely valuable. I want to get those beautiful under-ice pictures, with all their colorings, just as they are—in color.

And now I am again in Spitsbergen for the last act of Nautilus. She will be sunk one of these days. I feel sad about that old boat, our dear friend now. She has carried us safely through the dangers and hardships, but is, herself, condemned to die. Glory to her!



Left to right: Mr. Dored, Captain Danenhower and First Officer Schlossback



The Nautilus as she was going under the Polar ice.



Nautilus running, partly submerged, through the ice pack.

The Challenge of Direct Color*

by JAMES N. DOOLITTLE

IN DISCUSSING that photographic phenomenon by which it becomes possible to reproduce with sensitized materials, the colors of practically the entire visible spectrum, it is interesting to pause and reflect that we have but lately found a feasible working out of theories well known to the earliest experimenters.

Indeed, the practices which are, by now, a matter of routine, were described in veriest detail many years before the discoveries which have made direct color possible.

Interesting, too, is the observation that photography—since its inception, a tool of the artist—was early called upon to supply not only form and outline, but color itself, so that the hues of nature could be the more faithfully—and leisurely—translated into pigment upon canvas. Wedgwood, son of the eminent potter, first utilized photography in its most elemental form to transfix the images of leaves and floral forms for purposes of design, while at a much later date we find Samuel F. B. Morse, the portrait painter, endeavoring to capture the evanescent mood of his subject photographically—meanwhile finding time to invent the telegraph. That his efforts to capture moods were not too successful may be partly due to the fact that exposure in bright sunlight was a matter of several minutes!

Perhaps it is well for photography in general that early attempts along lines of direct color were unsuccessful, for much progress was made in monochromatic work—and the art brought to a high state of perfection by the latter part of the last century.

To Ives, inventor of the half-tone process, is attributed certain important advances in color, and it appears that he was among the first to introduce a method of producing "separation negatives" by simultaneous exposure with a means of subsequent processing by which a print was made in full color. The war interrupted developments which would, no doubt, have led to an earlier realization of a long-sought goal.

Upon two major discoveries depends the production of direct color as we now know it: the anastigmatic lens and the panchromatic emulsion. The speed and accuracy of the modern objective, together with a sensitized surface capable of quickly and selectively accepting the colors of the visible spectrum, is the combination essential to results which have now reached an advanced stage.

While in our present enlightenment we are able to make no extravagant claims, realizing that much yet remains to be accomplished, direct color is here; vehicles for its application abound, highly creditable work is being done and in a way that has placed it above many restrictions hitherto imposed.

The immortal, however, who gave expression to that phrase which established the unassailable veracity of the camera lived in an era far remote. His myopic vision did not encompass the color camera of today which, I am afraid, has adopted Ananias as its patron saint!

The color photograph is the result of no automatic procedure. Care, calculation—yes, some luck—are matters strongly depended upon to combat variable and contrary factors too numerous to contemplate and while we do not wish to leave the impression that the best color work is a successful courtship with the goddess of chance it is pointed out that it is amenable to few of the rules which are more or less taken for granted in monochromatic work. Perhaps it is best that we employ the

term "judgment" as a sort of cover-all requisite for the making of a color print; then if the result seems to take liberties with fact we may simply weigh your judgment against ours.

Which brings us close to another point. Two elements enter into an appraisal of any color work: the analysis of actual tints and hues and, a less tangible value, **color sensation**. It would be futile to expect a color-blind person to get the proper esthetic thrill from a picture no matter how nearly it approached perfection. Perhaps, on the other hand, one in full possession of his optical faculties would experience no joy in a master painter's conception of a glorious sunset. Color sensation again.

We are all, in a sense, color blind. Differently stated, we possess idiosyncrasies of particular color susceptibilities. The male of the genus **bos** is popularly supposed to react belligerently to red. It would be ruinous to expect him to placidly contemplate a painting of certain sunsets which we have rapturously beheld! Trained to a literal acceptance of camera images as entirely life-like, we automatically expect of direct color pictures an impossible—yes, often an undesirable adherence to fact. We know (?) that the unclouded sky is blue and blue it must be in the picture. But we do not stop to analyze the matter of **how** blue it is. In this instance, our judgment is as good as yours, for perhaps we have reproduced it exactly as we saw it. It may not **please** you—that's a matter of taste. Let us say, a matter of individual response.

We recently made a picture which, readily accepted as a piece of successful color rendering, was criticized because shadows cast by the objects were of bluish tint. This individual couldn't explain just what color shadows ought to be but was reasonably certain that they shouldn't be blue. While most photographers in colors recognize the ready tendency of either the blue or red component of the image to predominate, this is easily controlled where such preponderance is objectionable, but whether or not it is objectionable depends upon individual reaction to such hues. Here, again, we touch upon that which is expected of the camera. Is our instrument dealing lightly with the truth or is it more accurate than our own eyes?

Or, let us forsake, for the time being, our analytical faculties. We either like a thing or we don't. No explanation will help, for there is none. Do you thrill to the music of Debussy or does Al Jolson strike a more responsive chord? Perhaps you like both. That's better; you'll like my pictures. But seriously, your pleasurable reaction to one does not brand the other as either good or bad music. Individual susceptibility.

So far I have dealt merely with the finished photographic print which, if this be all that is desired, closes the book.

But suppose we are commercially minded and tri-color reproductions are wanted either for magazine "art", posters, cartons or whatnot. Here enters the photo-engraver. He is a particular sort of chap who thinks that our pictures are probably all right in a way, but he doesn't seem especially interested in them except as a guide to his subsequent operations. In this print he sees what colors are aimed at and forthwith proceeds to make a set of plates. Meanwhile, he has used our negatives from which he has made three—sometimes four—negatives through a screen upon glass and to the approximate size of the finished impression.

*Printed through the courtesy of Adcraft, Printers and Engravers, of Los Angeles, who furnished color plates used in this article—The Editor.



Photograph by James N. Doolittle



Miss Betty Recklaw

Photograph by James N. Doolittle



Three-Color Camera, repeating-back type, constructed by Mr. Doolittle. With it three 5x7 color corrected negatives may be made in an interval of 3 seconds

Each of our three negatives is correct in balance, contrast and register so his work is purely mechanical, is it not? Yes, emphatically, it is **not**. Our skies, which in this instance, actually turned out a true cerulean, need a whole lot of work, for although that part of our picture was composed of a certain admixture of the primaries, red, blue and yellow, he can use but one—blue—with possibly a very little of the red. So he puts the red and yellow plates on a machine which does things in a hurry with a very sharp little rotary bit. A little hand

tooling and the unwanted colors are gone. You see, in our paper print we work in what is known as "continuous tone", in which all color is a mixture of the three primaries, one over the other. Even perfectly neutral greys are composed of these, distributed in practically equal amounts. But in half-tone, various tints are created by the juxtaposition of these colors in the form of very minute dots separated by white paper. Therefore bits of all the colors are everywhere visible, which, without

(Continued on Page 22)

Lens Testing

by **DR. L. M. DIETERICH**

Consulting Engineer

Editor's Note: This is the second installment of a series of articles on Lens Testing by Dr. Dieterich. The first appeared in the November issue of this magazine. If you missed that issue and wish to have the complete series, copies of the November issue may be obtained from the office of the American Cinematographer. In the first article Dr. Dieterich discussed the test of focus, giving the method and the equipment needed. This month he starts with Speed as the objective.

Test No. 2 . . . Object of Test . . . f. Speed

METHOD OF PROCEDURE

Check rated speed by measuring free aperture diameter A_d , Fig. 5, and insert in formula: $f. = \frac{\text{Focus}}{A_d}$. Read $f.$ from test No. 1. Read A_d in mm.

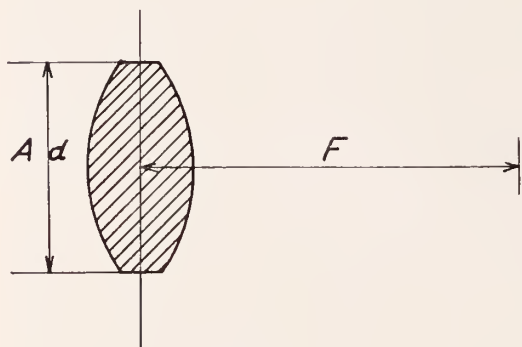


Fig. 5

Test No. 3 . . . Object of Test . . . Absolute Speed

METHOD OF PROCEDURE

(Under absolute speed, a.f., the $f.$ speed of a lens with 100% light transmission is meant)

After light transmission $f.$ of test lens in % value has been determined for test lens under Test No. 1, the $f.$ speed as determined under test No. 2 is divided by per cent. value $f.$ resulting in a.f. = $\frac{f.}{t\%}$. Example: If test lens was rated as $f. 2.5$, determined by test No. 2 as $f. 2.6$, light transmission under test No. 4 found as 89%, then the absolute speed is $a.f. = \frac{2.6}{.89} = 2.92$.

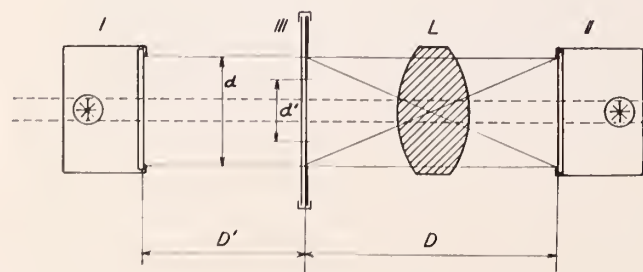
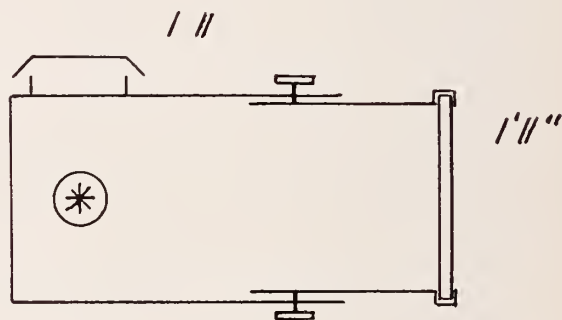


Fig. 6

Object of Test . . . Light Transmission

METHOD OF PROCEDURE

1. Calibrate two lamp (bulb) houses, I and II, Fig. 6, for even luminosity of ground glass plates I' and II', Fig. 7, with circular apertures, $d = 25$ mm. (approximately)



Top, Fig. 7. Bottom, Fig. 8

2. Place in plateholder III, Fig. 6, ground glass plate III', Fig. 8, with 25 mm. diameter opaque diaphragm mat, central circular spot of 10 mm. diameter of finer ground grain.
3. Place ground surface of III' at D, Fig. 6, .5 m from ground surface of II', light both bulbs and slide I on bench until gr' , Fig. 8, disappears. Then measure D' .
4. Replace III' and II' by square ruled plates O and I, as used in test No. 1 (Test for Focus in last installment), etched surfaces in places of ground surfaces.
5. Place test lens between II and III with bulb II only lighted, and slide until projected pattern of plate at II coincides with pattern of plate at III. Fix position of lens (1:1 magnification).
6. Remove square ruled plates and replace II' and III'.
7. Light both bulbs and slide I until gr' disappears.
8. Measure D'' and divided into D' ($D'' > D'$).
9. Light transmission of test lens L in per cent. then will be

$$f' \% = \frac{D'}{D''}$$

(To be continued)

New Filters for Exterior Photography With Super-Sensitive Film

by **EMERY HUSE** and **GORDON A. CHAMBERS**

West Coast Division, Motion Picture Film Department, Eastman Kodak Company

IT IS often desirable in photography to alter physically the spectral quality of the light by which a picture is to be made.

This alteration of quality can be readily accomplished by the use of light filters. A light filter in photographic terminology is usually a piece of dyed gelatin having definite selective absorption for light.

Photographic literature contains a great deal of information relative to filters. There is one paper in particular, that by L. A. Jones—"Light Filters, Their Characteristics and Applications in Photography"—published in the Transactions of the Society of Motion Picture Engineers. It is not the purpose of this paper to enter into a discussion of the theoretical aspects of light filtration. It is intended as an announcement of new filter combinations which are now available and which were designed specifically for use with the new Eastman Super-sensitive Panchromatic Negative film for exterior photography.

The filters which we are about to discuss are by name the "3N5" and the "5N5" filters. We must consider of course in any filter work the sensitivity of the photographic emulsion with which they are to be used. In this instance we are concerned with the sensitivity of the Super-sensitive film. Details relative to the Eastman Super-sensitive film were outlined in detail in a paper by the authors presented at the last meeting of this Society in Hollywood. This paper appears in the October, 1931, issue of the Journal. That a clearer picture might be had of the sensitivity of this film as compared with the sensitivity of the film it more or less replaced, namely regular Type Two Panchromatic film, we show in Figure 1, spectrograms of the two films just mentioned. It will be observed that the Super-sensitive film shows greater green and red sensitivity when exposed to the same source, in this instance daylight, than does the Type Two.

Figures II and III, show the spectrophotometric curves of the two filters in question. These filters are combinations of certain yellow filter dyes with a definite density of a neutral gray filter. The 3N5 is a combination of the Wratten Aero 1 plus a neutral density filter of approximately .50 (T. 32%). The 5N5 filter is a combination of the Wratten Aero 2 plus a neutral density filter of .50.

We should at this point make some mention of the use of neutral filters in practical cinematography. There has been very little written on the use of neutral filters for this practical type of work. One of the best articles on the subject is that by Joseph Dubray in the September, 1928, issue of the American Cinematographer. Mr. Dubray makes the following statements, "the exigencies of modern cinematography have brought about the use of a neutral gray light filter which serves to reduce the effect of the incident light upon the film without having recourse to either the reduction of the lens aperture or the reduction of the angular opening of the camera shutter. In other words, by the use of these filters the exposure can be regulated at will by the cinematographer while maintaining the desired depth of focus and color rendition." This summary by Mr. Dubray is, we believe, sufficient at the moment.

As was previously stated, the two filters referred to, namely, the 3N5 and the 5N5, were designed for use in exterior photography. There is nothing new about the Aero filters as such. The point being featured at this time is the combination of these filters with the neutral dyes. In the making of exterior motion picture scenes the cameraman rarely stops down the lens to the point where the depth of focus is approaching infinity. Many exterior scenes are shot with apertures as wide as f.3.5. Naturally with an emulsion whose speed is as high as that of Super-sensitive, and as a matter of fact even with slower speed emulsions, such as Type Two, the cameramen felt it necessary to cut down the exposure on exterior shots without stopping down the lens. The simplest way to accomplish this is to make use of neutral density filters. As these are obtainable in various degrees of density (and naturally transmission) it is possible to obtain neutral density filters which would allow the cameraman to make exterior shots at whatever aperture he desired, which was usually fairly wide open, and in the case of Type Two with a neutral density filter approximating .25 in density (56% T.) With the increasing use of Super-sensitive film cameramen found that this neutral density was not sufficient and that it was necessary to cut down the exposure still more. Attempts to promote stopping down lenses were unsuccessful in many cases so that the only alternative was to

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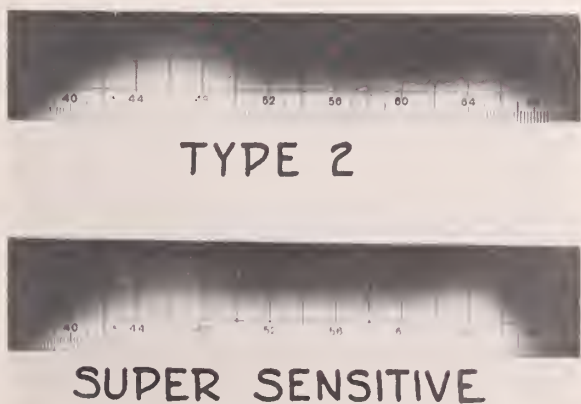


Fig. 1—Wedge spectrograms, daylight

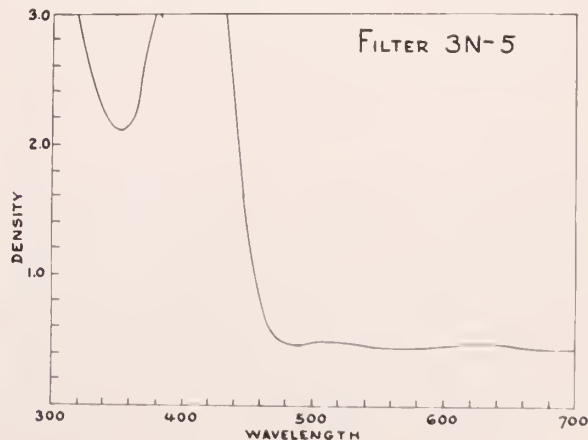


Fig. 2

The Measurement of Reverberation Time

by **F. L. HOPPER**

Electrical Research Products, Inc., Los Angeles

THE RECORDING and reproduction of sound pictures has brought many new engineering problems. This is particularly true in the acoustical field, since the acoustical properties of the enclosures in which sound is recorded and reproduced, are of primary importance as an aid toward securing a faithful reproduction of the original sound. Inasmuch as reverberation times is one of the criteria of the acoustic properties of an enclosure its determination is of primary importance as a step toward the solution of many of these problems.

While in many cases reverberation time may be computed with considerable accuracy, there are others in which measurement offers the only practical solution. This may be due to the complexity or variety of absorbing materials present, or to a lack of data regarding their absorption characteristics. Since absorption is a function of both panel vibration and porosity the manner in which the material is mounted has a marked influence upon its absorption. Often it will be found difficult to secure complete absorption data for all frequencies.

The disadvantages of the ear method are at once obvious. Short reverberation times are impossible to measure with any degree of accuracy; a variable human element is introduced by the ear; multiple rates of decay cannot be detected by this method; and since such measurements depend upon the determination of minimal audibility, they can only be made when extraneous sounds are excluded.

An electrical method in which the ear is replaced by a microphone, and some form of electrical timing device which may be operated by the sound after its intensity has decreased below a predetermined threshold, would be free from the limitations of the older method.

Several types of apparatus for measuring reverberation time electrically have been described recently. It is the purpose of this paper to describe one method which has been used in field work, and to give examples of the varying types of work which have been done with it.

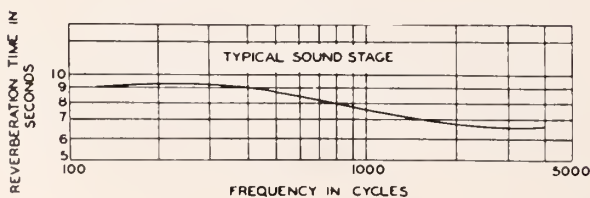


Fig. 1

The principle upon which the meter is based is simple. A microphone converts the sound energy into an electrical current which is amplified and then used to operate an electrical timing device. When the source of sound is cut off, the timing device begins to operate and continues until the sound intensity has decreased below some predetermined threshold value, at which moment it stops. The elapsed time is then found from the timing device. This device is designed to meet the following requirements. It is small and readily portable. It is capable of measuring reverberation times varying

from about 0.3 of a second to 15.0 seconds. It is arranged to measure the time required for the sound to decrease a maximum of 60 db in small progressive steps from 3 db up. It can be used to make measurements in the presence of moderate amounts of noise and is sufficiently simple in operation so that measurements may be made with considerable rapidity.

An approximate analogue for the decay of sound in a room is found in the discharge of a condenser through a resistance. Since the time of decay may be readily computed from the circuit constants, such a circuit may serve as a check for the meter. Several times of decay for various values of resistance were measured with this meter giving the following results:

Computed Time from Circuit Constants	Time Measured By Meter
.41	.42
.85	.87
2.09	2.03
4.55	4.48

Problems to which the meter is applicable, and those for which it has actually been used, may be divided into two groups; acoustic problems related to recording or pickup, and those involved in the reproduction of speech or music. In both groups we are interested in the determination and control of reverberation by suitable acoustic materials. This of course necessitates the determination of the acoustic properties of the materials themselves, and is readily accomplished by chamber reverberation methods.

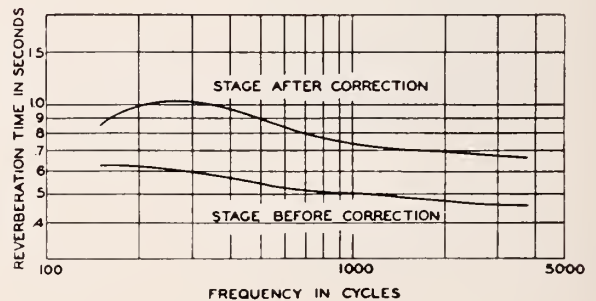


Fig. 2

Included in group one are sound stages, sets, stages used for musical scoring, and broadcasting studios. In the second are theatres, review rooms, and auditoriums or music halls.

Sound stages, in general, have been treated acoustically in an attempt to provide an approximation to outdoor conditions. Materials having a large amount of absorption are used, and consequently the reverberation times are short. The reverberation time frequency characteristics of a typical sound stage, measured with this meter, are shown in Fig. 1.

Not only is the acoustic material in the stage effective in providing short reverberation times, but it also forms a part of the sound insulating structure which prevents extraneous sound from passing through the stage walls. By the ear method the determination of the stage's properties would be difficult due to the short times involved.

Stages used for musical scoring are frequently more live than some of those designed primarily for the recording of speech, because a certain amount of reverberation has been found to improve the recordings of music made in such stages. The reverberation time is somewhat less for such a stage than would be the case were the room used for two ear listening. Then too, the frequency reverberation characteristics are of considerable importance and can only be determined satisfactorily by measurement. A scoring stage before and after acoustic correction is shown in Fig. 2. A portion of the original

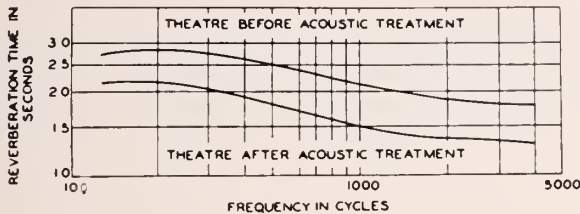


Fig. 3

treatment was covered up with a material having less absorption, the resulting difference being clearly shown by the figure. Recordings made under both conditions are considerably different, an appreciable improvement being noticed in records taken in the corrected stage.

Since, as shown by Eyring,* it is possible to have more than one rate of sound decay in a room, measurements will indicate the existence of such conditions, which might otherwise remain undiscovered. Practically, the existence of two rates of decay is a detriment to good scoring, since the notes of higher pitch

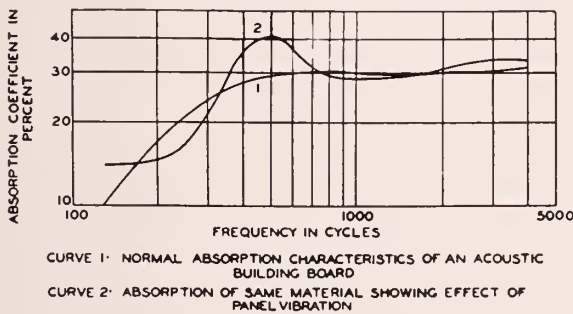


Fig. 4

have too long a hangover, giving an unpleasant effect to the music. This usually results from a lack of uniformity in acoustical treatment. For example, the side and end walls may be less absorbent than the floor and ceiling, under which condition the low frequencies would be absorbed more rapidly due to the fact that they are less directional than those of higher frequencies. Conditions, similar to those mentioned above for scoring stages, are experienced in the case of direct pickup in the broadcasting of programs from studios.

The acoustic correction of theatres from a purely commercial point of view is extremely worth while due to the increase in intelligibility and ease of listening. Theatre patrons while perhaps not associating the improvement with acoustic treatment, recognize it, and consequently tend to patronize those theatres which afford the best listening conditions. In the small theatre, the reverberation time may be computed satisfactorily. In

the larger theatres, or those in which a large amount of surface is exposed, the results of measurement and computation are often not in good agreement. Consequently, in some cases it is advisable to base recommendations for acoustic treatment upon measurement. Fig. 3 shows the characteristics of a theatre as measured before and after acoustic treatment.

The electrical method of measurement is especially adaptable to the determination of absorption coefficients by the chamber reverberation method. Shorter times may be measured, hence larger areas of material may be tested, giving a more average sample.

It is especially important that the samples be mounted or applied in the same way in which they are to be used, since their absorption characteristics may depend upon several factors such as, porosity and panel vibration. This is illustrated in Fig. 4, which shows the absorption characteristics for a well known

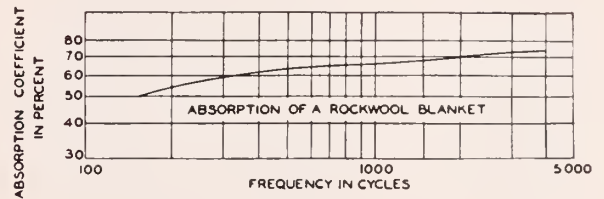


Fig. 5

acoustic building board. One curve shows the normal type of absorption in which no panel vibration is present while the second shows the absorption for the board mounted in such a way that it was free to vibrate as a panel. While the difference between the two curves may not be entirely due to panel vibration, it serves to illustrate the point in question. The necessity for measuring absorption coefficients under conditions of use and over a wide range of frequencies is apparent. Fig. 5, gives the absorption characteristics for a rock wool blanket having a high coefficient of absorption. Materials of this type are used quite generally in sound stage construction.

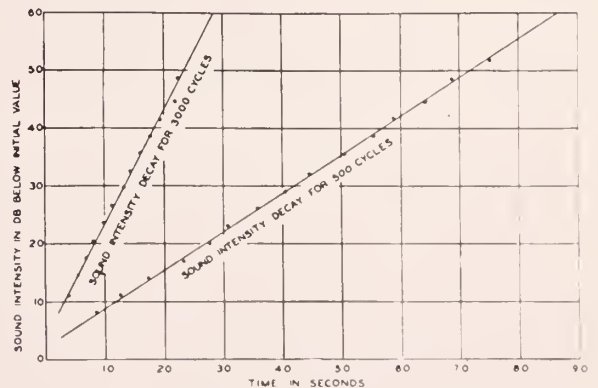


Fig. 6

Fig. 6, illustrates two typical sound intensity decay curves taken in an empty reverberation chamber. These curves indicate the other extreme in reverberation times, which may be measured with this instrument.

The final degree of satisfaction obtained in listening to recorded or original speech or music depends, to a large extent, upon the control of reverberation. This in turn requires the determination of optimum reverberation conditions and the provision of materials for obtaining them. The usefulness of the reverberation time meter as an adjunct to these problems is obvious.

* "Conditions Under Which Residual Sound in Reverberant Rooms May Have More Than One Rate of Decay." Carl F. Eyring, Society of Motion Picture Engineers, May, 1930.

Filters and Filter Factors

For Eastman Panchromatic Films

by **EMERY HUSE** and **GORDON A. CHAMBERS**

West Coast Division, Motion Picture Film Department, Eastman Kodak Company

THE INTRODUCTION of Panchromatic films into the Motion Picture Industry necessitated a greater use of and demanded more knowledge regarding light filters. The special information desired relative to filters was the simple term referred to as the "filter factor". It is the purpose of this article to fully define the term and present tables showing filter factors for Eastman Panchromatic films.

It is more important to understand what a filter is, what it does, and why, than it is to know how much exposure is required when a filter is used. To that end a brief discussion of filters is in order.

Light filters could be called "light transmitters" or "light absorbers", but the word "filter" is applicable to both transmission and absorption in that it selectively filters out the undesirable light and transmits that which is desired.

In the present day motion picture practice two basic types of light sources are used, artificial and natural. Under the artificial head comes those sources using tungsten (Mazda lamps) and those using carbons (flame arcs). The natural source of light is daylight, including sunlight. The present day types of Panchromatic film, especially the Super-sensitive, are self-filtered and accommodate themselves to artificial light without the use of light filters, except in the case of color photography. This is an intentional phenomenon inasmuch as the greater percentage of scenes "shot" in motion picture production are made under artificial sources of light. The use of filters, therefore, is limited almost exclusively to exterior black and white photography. It is not desired to convey the impression that filters are absolutely necessary in exterior photography but their proper use greatly enhances the results. It is interesting to know why this is true. The reason is bound up within certain physical facts contained under the general heading of light.

WAVE LENGTHS

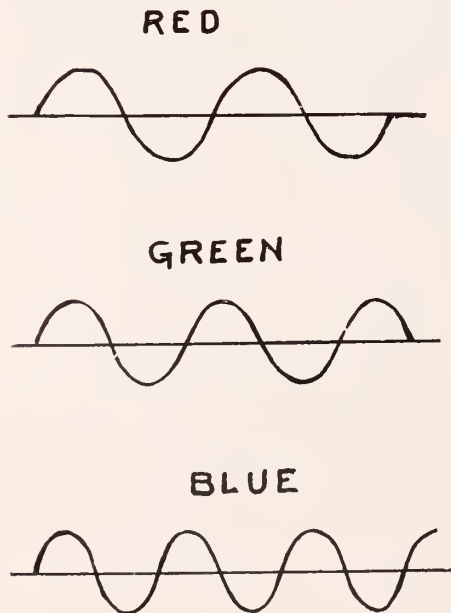


Fig. 1

Filters are prepared from organic dyes which have been especially selected for this type of work. They are made by coating gelatin containing a given weight of dye upon prepared glass, and after drying, stripping the gelatin film from the glass. Filters are supplied in the form of gelatin film as such or cemented between two pieces of optical glass.

A greater understanding and appreciation of filters will be had with a greater knowledge of some of the facts concerning

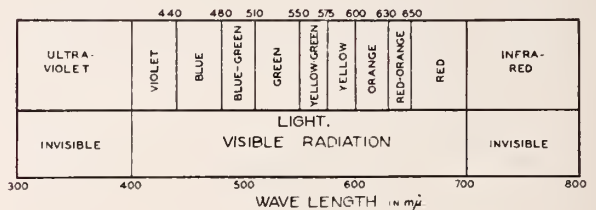


Fig. 2

With the aid of a spectroscope, an instrument in which light is examined after being passed through a prism, light can be analyzed into its component parts. If the original source of light was "white" the various colors composing it will be seen through the spectroscope merging into one another in a continuous band, but if the light is colored there will be breaks or absorptions in the band. Filters produce this latter result and it is for this reason that white light looks colored when examined through a selectively absorbing filter. Both daylight and tungsten can be considered white light in the general sense of the term in that they both show, upon spectroscopic examination, a continuous band of merging colors extending from the visible violet through the spectrum to the limit of the visible red. However, although these two sources can be considered white light, they are not identical because their relative proportions of certain colors differ. Daylight is considered white light in the broad sense of the word only.

Just as in sound we have notes of different frequencies, i. e., so many waves per second falling on the ear, so with light we have different frequencies of vibration falling on the eye. Light is considered a wave form of motion in ether. Since the velocity of light, 186,000 miles per second, is the same for waves of different frequencies, it is clear that waves of high frequency will be of shorter wave length than those of low frequency. Experiment will prove that the wave lengths of blue light are shorter than those of green light and that both are shorter than red light. Figure 1 shows the relative length of the waves corresponding to the various colors, the diagram being drawn to scale. Since there is a definite relationship

between wave length and color, a scale may be made in which the different wave length numbers correspond in position with the different colors in the spectrum. A scale of this type is shown in Figure 2. The numbers representing wave length are expressed in terms of millimicrons ($m\mu$) one $m\mu$ being equal

to 0.000001 millimeter. Figure 3 shows actual spectrograms made photographically of Eastman Type Two and Super-sensitive films expressed in terms similar to those described above. These spectrograms show the relative sensitivity of these emulsions to various wave lengths.

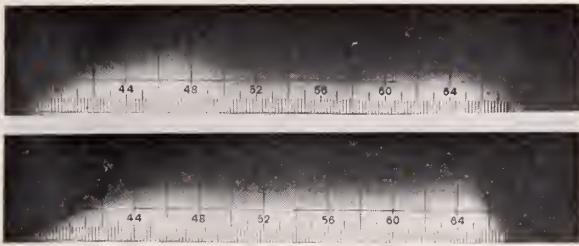


Fig. 3—Upper, type 2, lower, supersensitive

Up to this point consideration has been given to light and wave length, and film sensitivity. Filter transmission will now be discussed.

In Figure 4 is presented what is termed the spectrophotometric curve of one of the Wratten light filters, No. 58. This curve expresses the characteristics of the filter in similar form to that shown for the films in Figure 3. The coordinates of this filter curve are wave length and density (or transmission).

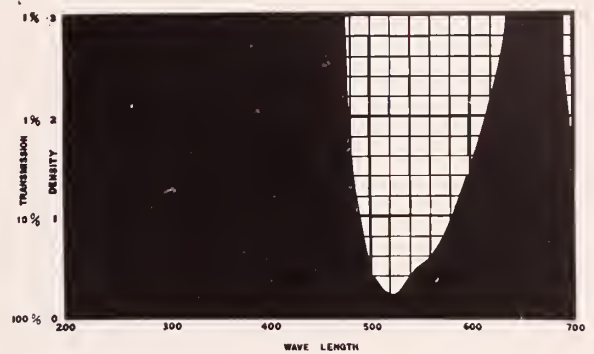


Fig. 4

Density is defined as the common logarithm of $\frac{1}{T}$ where T = transmission, so that a density of 1.0 corresponds to a transmission of 10%, a density of 2.0 to a transmission of 1%, a density of 3.0 to a transmission of .1% etc.

Referring to Figure 4, it will be seen that at wave length 520 this filter has a density of a little less than 0.3, which is the logarithm of 2 so that at this point the filter transmits rather more than one-half the incident light. At a wave length of 580 the filter has a density of 1.0 and therefore transmits 10% of the light at this point and also at the other side of its

same degree of exposure is desired from the same scene when photographed through a filter on the same emulsion. For example, if a filter has a factor of 4, then to use it and obtain a properly balanced exposure it is necessary to increase the exposure normally given without a filter by that factor. Assume that the unfiltered condition is normal cranking speed, normal shutter opening, at a stop of f.8 in a standard motion picture camera. The filter factor of 4, as previously mentioned, means that this stated exposure condition must be increased four times when using the filter. The usual procedure is an adjustment of the lens stop allowing speed and shutter to remain constant.

(Continued on Page 24)

	No Filter	Aero 1	Aero 2	3M5	5M5	12	G (15)	23A	A (25)	T (29)	ND 0.25	ND 0.50	ND 0.75	ND 1.00
1.4														
1.8		1.6												
2.0		1.8	1.6								1.5			
2.3		2.0	1.8			1.4					1.7			
2.8		2.5	2.3	1.4		1.8	1.6	1.6	1.4		2.1	1.6		
3.2		2.8	2.6	1.6	1.4	2.0	1.8	1.8	1.6		2.4	1.8		
3.5		3.1	2.8	1.8	1.6	2.2	2.0	2.0	1.8		2.6	2.0	1.5	
4.0		3.6	3.2	2.0	1.8	2.5	2.3	2.3	2.0	1.4	3.0	2.3	1.7	
4.5		4.0	3.7	2.3	2.0	2.8	2.6	2.6	2.3	1.6	3.4	2.5	1.9	1.4
5.6		5.0	4.5	2.8	2.5	3.5	3.2	3.2	2.8	2.0	4.2	3.2	2.3	1.8
6.3		5.6	5.2	3.2	2.8	4.0	3.6	3.6	3.2	2.2	4.7	3.5	2.6	2.0
8.0		7.1	6.5	4.0	3.6	5.0	4.6	4.6	4.0	2.8	6.0	4.5	3.4	2.5
11.0		9.8	9.0	5.6	4.9	7.0	6.3	6.3	5.6	3.9	8.2	6.2	4.6	3.5
12.5		11.2	10.2	6.3	5.6	7.9	7.2	7.2	6.3	4.4	9.3	7.1	5.3	4.0
16.0		14.3	13.0	8.0	7.2	10.0	9.2	9.2	8.0	5.6	12.0	9.1	6.7	5.0
22.0		19.7	18.0	11.0	10.0	14.0	12.5	12.5	11.0	7.8	16.5	12.5	9.3	7.0
Factor	1	1.25	1.5	4	5	2.5	3	3	4	8	1.8	3.1	5.6	10

N.D. = Neutral Density

Fig. 5—Eastman supersensitive panchromatic filter exposure table for daylight expressed in "f" values

HAL HALL

says



Thanks, Mr. Wilkerson

ONE of the most gratifying moves on the part of the various trade publications is the inauguration of a weekly page devoted to the motion picture cameramen in the Hollywood Daily Reporter. Mr. W. R. Wilkerson, able editor and publisher of that paper, is to be congratulated on this move.

Too long have the journals and papers of the motion picture world neglected the cameramen; and it is really stimulating to see that they are now recognizing the importance and the metropolitan newspapers, too, recognizing the fact that the cameraman really is somebody in the picture world. Harry Burns of the Hollywood Filmograph; Harrison Carroll of the Los Angeles Evening Herald, Edwin Schallert of the Los Angeles Times, and the reviewers on Variety and Film Daily and the Hollywood Herald have of late been doing their part, also, in giving the cameramen recognition, and this writer congratulates them for their attitude, and hopes that they will not only continue to give them credit, but will more and more see their importance and worth and increase the space in which they receive mention.

There is no group of individuals in the motion picture industry who give more conscientious effort to their work than the cameramen. Always thinking of improvement in quality of photography, these men spend hours of their own time studying ways and means to give the industry better results. While some individuals in the picture world rush from the studio to appear in public places where their personal vanity may be swelled by public acclaim, the cameraman is usually found somewhere apart from all this, trying to figure out a way to make a picture more pleasing to the eye.

A word of mention; a pat on the back; a bit of deserved recognition now and then is but slight reward for intelligent and artistic effort. Why not give it to these men who so often by their photographic ability turn what would be a failure into a picture that "goes over"!

The Cinematographic Annual

VOLUME TWO of the Cinematographic Annual is now off the press, and already we are feeling that happy glow that comes from words of praise. It makes us particularly happy to discover that the motion picture world has really been anxiously waiting for this book to come from the press.

We have tried to produce a book that would be an improvement over Volume One, and we hope and feel that we have succeeded; however, that remains for the judgment of those who read it. For those who love photographic beauty, we unhesitatingly urge you to get this volume, for it contains a pictorial section of 64 pictures which we feel should delight the eye of anyone who admires pictures.

Professional and amateur cinematographers will find a wealth of material for them. Sound men will find that subject treated adequately. Art directors and laboratory men and still photographers will find their field well represented, as will the projectionists and theatre executives. In short, we have tried to make the book as representative as possible in the motion picture field. We hope you like it.

Merry Christmas

AGAIN the Yuletide season rolls around, and we take this opportunity of wishing all our readers a Merry Christmas.

To countless thousands this will not be a very merry Christmas, we fear, judging from reports that filter in from all parts of the world. Jobless fathers, anxious mothers, hungry children, pinched faces, aching hearts—that is what will be found on Christmas morning in thousands of homes where once the merry ring of happy, childish laughter peeled forth as the youngsters dashed to the Christmas tree to discover what Santa had brought them.

Wouldn't it be the proper thing for all of us to select at least one of these families and see that there is a real Christmas in at least one home where unemployment and poverty plans to bring a present of unhappiness? Won't it make each of us happier—make the Christmas brighter—if we sit down to our Christmas dinner with the knowledge that we have made it possible for another family to forget—at least for the day—the hunger and want that is knocking at the door?

After all, what is Christmas? The birthday of the One who gave His life on the cross for others. Wouldn't it be more in keeping with the day to deprive ourselves, if necessary, in order to make others just a little bit happier?

The Amateur Contest

TRULY remarkable is the interest among the amateurs in the \$1000.00 Amateur Movie Making Contest now being conducted by this magazine. Although the contest was started only a month ago, entries have already been received from all parts of the United States, and letters of inquiry are coming in daily.

This contest, the rules of which appear on page 31 of this issue, is one of the biggest opportunities for recognition ever given the Home Movie maker. And then, there is the first prize of \$500.00 which should spur amateur clubs who wish to bolster up the treasury. There are three other prizes of \$250.00, \$150.00 and \$100.00 respectively. This contest is strictly for the amateur, so no Home Movie Maker need fear that he will not have a chance and that a professional will get the prizes. No professional is allowed to enter a picture. If you are an amateur, we suggest that you turn to page 31 and read the rules. Then enter this contest which is being sponsored by the American Society of Cinematographers.

Filters and Filter Factors

IN THIS issue of the Cinematographer will be found one of the most important articles that has appeared in connection with motion picture photography in years. It is the article on Filters and Filter Factors. For years cameramen have been asking for an exposure table such as accompanies this article. Now, we are pleased to present this article and the exposure tables to them. If any reader wishes a reprint of this article, it will be furnished at no charge if you will just write to the editor of this magazine.



The Wave

H. M. Armstrong



A Breaker on a Storm-Swept Shore

H. M. Armstrong



Alfred L. Gilks, A.S.C.



Alfred L. Gilks, A.S.C.

New Filters For Exteriors

(Continued from Page 13)

use neutral density filters of lower transmissions (increased density) or to cut the angular opening of the shutter. This latter feature has several undesirable aspects and therefore is not adopted. Inasmuch as the speed of the Super-sensitive film to daylight is approximately twice that of Type Two, it is very simple to adopt neutral filters whose transmissions are half those used for Type Two.

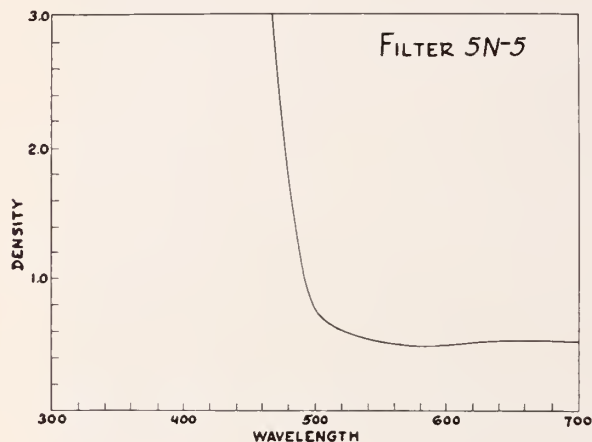


Fig. 3

The sensitivity of the Super-sensitive film when compared to Type Two is such that in effect the Super-sensitive film has approximately a K2 filter correction within itself. It will be observed from the spectra of these two emulsions that the basic difference in the spectral characteristics between Super-sensitive and Type Two is the increased proportion of red sensitivity of the Super-sensitive. Because of this fact, primarily the K series of filters up to and including the K2 have relatively little effect on Super-sensitive film, either from the standpoint of exposure or color correction. Experience has shown that the K3 and G filters normally produce over-corrected results on Type Two, but this is not true in the case of Super-sensitive film. With Super-sensitive it is desirable to have filter corrections of a lesser degree than the G or K3 filters give. To accomplish this we have tested several filters and it was found that the Aero filters produced these lesser correction effects quite satisfactorily and can be used as intermediates between the clear and the K3 or G corrections.

These Aero filters upon tests by various cameramen have proved to be extremely satisfactory but as was the case for either unfiltered or filtered shots, the neutral density filters were also used. It was because of the seeming necessity of using two filters that the Aero 1 and 2 filters were made each containing the neutral gray dyes so that both the correction and the decrease in exposure could be accomplished with the use of a single filter. A study of these filters to determine their exposure factor shows that for Type Two the 3N5 filter has a filter factor of 5, while the 5N5 has a filter factor of 8. For Super-sensitive film the 3N5 has a filter factor of 4, while the 5N5 has a filter factor of 5. It would be well to state at this point what a filter factor is. When a filter which absorbs some of the radiation to which the photographic material is sensitive is placed over the lens of the camera, it is evident that an increase either in exposure time, in the lens aperture, or in the illumination incident upon the object, must be made in order to obtain the same exposure on the negative as when no filter is used. The magnitude of the filter factor depends upon the conditions under which the filter is used and its determination involves a knowledge of the spectral sensitivity of the photographic material, the spectral distribution of energy in

the radiation which illuminates the object, and the spectral absorption of all components of the optical system between the objects and the photographic material. The factors quoted previously take into consideration the sensitivity of the emulsion, the spectral distribution of daylight, and an average camera lens.

The method of applying the filter factors given above is very simple. Let us consider the case of 3N5 filter and Super-sensitive film. The factor given is 4. This means that it is necessary to increase the exposure normally given without the filter four times. From the standpoint of lens stop, if the unfiltered shot was made at an aperture of f.4 then the aperture should be increased to f.2 to take care of the filter factor. By a simple computation it can be readily seen that the amount of light passing through the stop f.2 is four times that passing through f. 4. If the factor is 5, or any other figure, the aperture to accommodate the filter factor can be computed by the following simple formula:

$$\frac{f'}{F.F.} = f$$

where f' = square of stop with no filter
 f = square of stop with filter
 F.F. = filter factor

For example, if as stated above the unfiltered shot was made at f.4 then $f' = 16$; if the filter factor was 4 then F.F. = 4 the stop f^2 at which to make the filtered shot is

$$\frac{16}{4} = f^2 \text{ or } \frac{16}{4} = f^2$$

therefore $f^2 = 4$
 $f = 2$

If the filter factor is 5 as would be the case when using the 5N5 filter, then by the above reasoning

$$\frac{16}{5} = f^2 \text{ or } f = 3.2 \text{ and } f = 1.8$$

Since these filters have been available only recently, no examples of their use may be cited. However, several cameramen are using these at the present time in current productions in Hollywood.



The Challenge of Direct Color

(Continued from Page 11)

the special treatment referred to, would cause a somewhat weird effect. Other modifications such as burnishing, re-etching, stopping-out, etc., are resorted to in order to perfect the reproduction.

While a certain amount of "control" is necessary even with a perfect set of negatives, imagine the added labor and expense when the engraver has to supply some deficiency in "correction" caused by unbalanced camera filters, incorrect exposure or improper development! Certainly, it is up to the photographer to take every precaution in carrying out his end of the direct color process.

However, these last are all "back-stage" details which interest you but little. Your main concern is with the perfection of the finished product, its fidelity to life, according to your—not our—conceptions and at a price commensurate with the added effectiveness of "direct color".

NOT *too good* *to be true*

WHEN Eastman announced a new negative film two to three times as fast as previous emulsions, the news seemed almost too good to be true. However, Eastman *Gray-Backed* Super-sensitive Panchromatic Negative has lived up to every claim made for it... and more! It has brought benefits that no one could foresee. It has strengthened every link in the production chain. Naturally, it makes its greatest contribution to *the cameraman*. If you are not already using Eastman *Gray-Backed* Super-sensitive, get acquainted with it at once. Only by means of this ultra-fast, gray-backed negative can you bring your artistry to its fullest possible expression.

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Fox Theater Assignments

RECENT personnel assignments among Fox theatres around the country include the following: Richard Dixon has been appointed assistant manager of the Fox, Nemo, New York. J. Benjamin remains as manager. Louis Golden replaces Robert Cuzan as manager of Embassy, Los Angeles. Paul Barry replaces Golden as manager of the Rosemary, Ocean Park, Calif. Robert C. Cannom replaces J. D. L'Esperance as manager of the Orpheum, San Diego. J. D. L'Esperance replaces George Christoffers as manager of the Egyptian, San Diego, and also replaces Franklin Elledge as manager of the Fairmount, San Diego. Mel Todd has been appointed manager of the Fox Paramount, Cheyenne, Wyo. C. E. Miller is now manager of the Strand, Cheyenne, Wyo. H. B. Ashton has been made manager of the Fox Paramount, North Platte, Neb. Jack Burke has been made treasurer and Kenneth Henry assistant manager of the Park Plaza, New York.



New Reeves Catalogue

A NEW catalogue of unusual merit has just been issued by the Hollywood Motion Picture Equipment Co. Ltd., of Hollywood. The catalogue not only covers the various equipment thoroughly, but gives one of the best expositions of the fundamentals of sound that a practical man can find. Mr. Reeves, head of the company, is to be congratulated upon his very excellent piece of work.



Filter Factors

(Continued from Page 17)

To increase the aperture so that four times the amount of light gets through the lens means opening the lens to twice the aperture, which in this case would be f.4. Therefore, the same scene previously photographed unfiltered at f.8 can now be photographed with the filter whose factor is 4 by opening the lens to f.4. This reasoning of course is based upon the fact that the amount of light passing through the lens apertures varies as the square of the opening.

Bearing in mind all of the above facts the filter factors of several filters were determined experimentally on the two Panchromatic films to daylight. This was accomplished by sensitometric

determinations on the two films under daylight quality of illumination for both filtered and unfiltered conditions. The factors represent the ratio of speed between the two tests. These sensitometric results were then applied practically in a camera and excellent agreement was found between the sensitometric and practical tests. These filter factors were then expressed in terms of lens stops and computed into tabular form in the manner shown in Figures 5 and 6.

It will be observed that these tables show the filters across the top, the filter factors across the bottom, while the extreme left hand column shows a series of arbitrarily chosen lens stops under the head "no filter". All values are expressed in terms of "f" values. The use of the table is extremely simple. Suppose a given scene is to be photographed on Super-sensitive film, both unfiltered and filtered. Suppose the unfiltered stop to be f.5.6. Suppose further that the filtered exposure was to be made with the G filter. Select in the first column under the heading "no filter" the value of f.5.6, project across the table in the line showing this value until the column headed G filter is reached. At this point the value of f.3.2 is found. Therefore, the scene shot unfiltered at f.5.6 can now be shot filtered with the G filter at f.3.2 and equally exposed negatives will be obtained, although the filtered scene will show a different relation between the sky and foreground, due to the selective absorption of the filter. It must be borne in mind that the values listed in Figures 5 and 6 are very accurately determined. Therefore, a lens stop nearest the value listed for any specific instance will undoubtedly answer in practical work. The filters listed in the tables are those used to the greatest extent in straight photography, filters for night effects and other unique shots are not included, as their use is for distinctly different purposes, and for such filters balanced exposures are not desired.

It would no doubt be of value if definite filters could be quoted as the ones to use in certain definite instances. This cannot be done as conditions under which filter shots are made vary tremendously. It is therefore necessary for the cameraman to size up the situation and act according to the dictates of his filter knowledge. It must be remembered that to subdue a color a filter whose color is the complement of that to be subdued must be used, while to lighten a color a filter of the same color must be used, which filter fully transmits the desired color and subdues the others.

It is hoped by the authors that the facts and data presented in this article will be of practical use to cameramen in motion picture production and make their use of filters easier and more effective.

No Filter	Aero 1	K 1	Aero 2	K 2	K 3	5N5	5N5	12	G (15)	23A	4 (25)	ND 0.25	ND 0.50	ND 0.75	ND 1.00	
1.4																
1.8																
2.0	1.6	1.6										1.5				
2.3	1.8	1.8	1.4									1.7				
2.8	2.3	2.3	1.8	1.6	1.4							2.1	1.6			
3.2	2.6	2.6	2.0	1.8	1.6	1.4		1.5	1.4			2.4	1.8			
3.5	2.8	2.8	2.2	2.0	1.8	1.6		1.7	1.6	1.4		2.6	2.0	1.5		
4.0	3.2	3.2	2.5	2.3	2.0	1.8	1.4	1.9	1.8	1.6		3.0	2.3	1.7		
4.5	3.7	3.7	2.8	2.6	2.3	2.0	1.6	2.1	2.0	1.8	1.4	3.4	2.5	1.9	1.4	
5.6	4.5	4.5	3.5	3.2	2.8	2.5	2.0	2.6	2.5	2.3	1.8	4.2	3.2	2.3	1.8	
6.3	5.2	5.2	4.0	3.6	3.2	2.8	2.2	3.0	2.8	2.6	2.0	4.7	3.5	2.6	2.0	
8.0	6.5	6.5	5.0	4.6	4.0	3.6	2.8	3.8	3.6	3.2	2.5	6.0	4.5	3.4	2.5	
11.0	9.0	9.0	7.0	6.3	5.6	4.9	3.9	5.2	4.9	4.5	3.5	8.2	6.2	4.6	3.5	
12.5	10.2	10.2	7.9	7.2	6.3	5.6	4.4	5.9	5.6	5.1	4.0	9.3	7.1	5.3	4.0	
16.0	13.0	13.0	10.0	9.2	8.0	7.2	5.6	7.5	7.2	6.5	5.0	12.0	9.1	6.7	5.0	
22.0	18.0	18.0	14.0	12.5	11.0	10.0	7.8	10.3	10.0	9.0	7.0	16.5	12.5	9.3	7.0	
Factor	1	1.5	1.5	2.5	3	4	5	8	4.5	5	6	10	1.8	3.1	5.6	10

Fig. 6—Eastman type 2 panchromatic filter exposure table for daylight expressed in "f" values



Announcing . . .

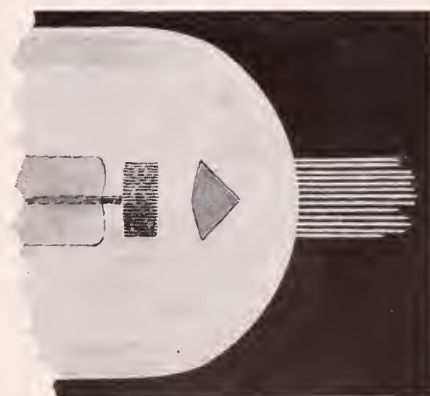
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Microscopic Films Show Blood Stream in Color

AIDED by powerful magnifying lenses and some exceptional microscopic cinematography Universal's "Strange as it Seems" reel is bringing to the screen a novel subject.

By arrangement with S. R. Woodward, biological cameraman, Nathan, Hahn and Fairbanks, sponsors of "Strange as it Seems" are presenting moving pictures in Multicolor of the blood stream in a frog's webbed foot. Enlarging the transparent frog's foot, for the first time audiences may see how blood flows through the veins, white and red corpuscles 1000 times their natural size on the film and enlarged nearly a million times on the average theatre screen.



Stokowski to Address S.M.P.E.

LEOPOLD STOKOWSKI, director of the Philadelphia orchestra, will address the meeting of the New York Section of the Society of Motion Picture Engineers this month in the auditorium of the Engineers Building (33 West 39th Street) in connection with the first public demonstration of a new system of recording and reproducing music and voice.

This new system, perfected by the Bell Telephone Laboratories, is a development and elaboration of the "hill and dale" or vertical cut recording used by Thomas A. Edison in his first phonograph. The new system makes possible, it is said, the reproduction of music as played by the largest orchestras with a quality and naturalness never before possible. It will be explained and demonstrated by Mr. H. A. Frederick of the Bell Laboratories.

Music especially recorded for this demonstration will be reproduced by the new system using amplifiers greater in size than are used in even the largest motion picture theatres.

New Industrial Film Firm

BEN BLAKE, formerly in charge of production for Warner Bros. Industrial Pictures and previously vice-president of the Stanley Advertising Co., has organized B. K. Blake Co. to produce industrial and educational pictures. The concern has contracted to handle productions for three important advertising agencies.

9.5 MM. Talkies

A COMBINATION 9.5 mm., sound projector, screen, radio and phonograph, capable of supplying picture and sound to an audience of 300, has been put on the market by Pathegrams, subsidiary of Pathe Exchange. Pathe features and shorts will be rented at one dollar a reel, including disc, for each 24 hours.

40 From Monogram

MONOGRAM Pictures has set a tentative schedule of 40 features for next season, against 28 planned this season, it is announced by W. Ray Johnston, president. Visiting exchanges in Los Angeles, San Francisco, Kansas City, St. Louis, Chicago and Cleveland, Johnston says he found a big and growing demand for independent product.

Talking Picture Shows Lamp Manufacture

MAZDA Lamps Preferred," the first talking motion picture showing the manufacture of Mazda Lamps had its premiere November 17 at the Euclid Theatre, East Cleveland, and has caused much favorable comment. While quality manufacturing is the theme of the picture, with many "shots" depicting busy departments of the Nela Park research laboratories, a historical background is supplied by scenes showing Thomas A. Edison and Francis Jehl, only surviving member of Edison's original laboratory assistants, re-creating the incandescent lamp at Dearborn on the night of Light's Golden Jubilee. These views were taken at Henry Ford's replica of Menlo Park at Dearborn, Mich.

Screen Broadcasts In Technicolor

SCREEN Broadcasts of the Theatre Service Corporation, now exhibited in more than 3,000 theatres including virtually all of the Publix houses, will hereafter be produced in natural colors by the new Technicolor grainless process, according to William Johnson, President of Theatre Service Corporation.

For sixteen years, Mr. Johnson has been engaged in the business of screen advertising and his service has approximately 10,000 retail subscribers in 1400 cities covering 41 states.

More than 250 subjects already have been filmed in Technicolor, Mr. Johnson said, and will be released beginning about November 1. Each Screen Broadcast is fifty feet in length and not more than six are included on any program; being short and entertaining, with accompanying music, they are well received by the public. They bring added revenue to the exhibitors.

The contract for the Screen Broadcasts is the largest ever given to any color film company for advertising films.

Hal Mohr, a Flyer

HAL MOHR, Hollywood cameraman and former president of the American Society of Cinematographers, is the latest film colony air enthusiast to receive his pilot's license. Mohr got the license last month and in doing so established some sort of record as he received it just two months from the day he started taking lessons while all during that student period he was photographing productions at the RKO-Pathe studios. The lessons came in the early mornings. Billy Skall, one of Mohr's Assistant cameramen and a war flyer with a distinguished combat record, was the teacher.

The flying cameraman has just been assigned to do Constance Bennett's new picture, "Lady With a Past". He photographed her last RKO-Pathe production, "The Common Law".



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have long since learned that this organization is qualified to meet their most exacting lighting requirements. . . . Whether LACO incandescents, or BROWN-ASHCRAFT arcs — both indisputably superior products in the lighting equipment field — we are able, at a moment's notice, to supply your demands . . . , and our *experience* is your assurance of satisfaction.

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.. In the Realm of Sound ..

Sound System For "Hamlet"

ANOTHER innovation for legitimate stage productions has been contributed by Electrical Research Products Inc., with the opening in New York of Norman Bel Geddes "Hamlet" at the Broadhurst Theatre. Shakespeare's century-old lines have been enhanced by modern science in the form of music and sound effects coming from the loud speakers of a Western Electric Music Reproduction System.

Special recordings have been made of a type similar to those used for electrical transcription programs broadcast over the radio. Twin turn-tables, operating at $33\frac{1}{3}$ revolutions per minute, are so arranged that there is no pause in switching from one record to the next, and also provide for superimposing one sound effect upon another. This superimposing facility is used to particularly marked advantage in the ghost scene, during which the weird sound of the wind at midnight continues through a brief musical selection which heralds the appearance of the ghost.

The sound from the "phonograph records" is reproduced through five loud speakers located at various positions backstage and controlled by a switching system which permits selective or simultaneous operation. Thus, in the mob scene by switching from one speaker to another in sequence the sound gives the illusion of a crowd surrounding and approaching the citadel, and the weak, far-off, murmurs and cries develop to a great climax and loud cheers when the gate is finally broken down.

The prelude, overture and entire musical accompaniment to the show is reproduced over the system—there being no orchestra or other conventional music used in connection with the play.

The reviews and audience comments in Philadelphia, where the Bel Geddes production had its try-out last week, were enthusiastic about the entertainment value contributed by the unusual music and sound effects.

"Hamlet" marks the fourth recent major stage production in which Western Electric sound equipment has been used. The first was the "Miracle of Verdun," the Guild production where synchronized music and sound were used to heighten stage realism. The George White "Scandals" at the Apollo Theatre has a Public Address System installed to reinforce the voices of the actors and singers, thus making rear seats as desirable as the front row from a hearing standpoint. In the new Earl Carroll Theatre where the "Vanities" is meeting with such success, a complete system of general reinforcement, including facilities for curtain call, announcements, manager's call system and reproduction of the stage program throughout the dressing rooms, is an important part of the theatre's equipment.

The installation for "Hamlet" was arranged by J. J. Way, Public Address Specialist, and H. A. De Palma, Supervising Engineer for Electrical Research Products.

Photophone Distributing New Disc

WITH a market of approximately 4,000 theaters employing the disc method of sound reproduction, RCA Photophone has begun the distribution of a new type of disc record which has been developed and perfected by the Engineers of the RCA Victor Co. in Camden, N. J.

Known as the Victrolac Record, the important features claimed by the company which make it superior to the old style of shellac record are the reduction in size from 16 inches to 12 inches in diameter, the pronounced reduction in weight from 24 ounces to four ounces, its flexibility and durability, improved tone quality and a minimum of surface noise.

The company states that 90 per cent of the producers have arranged to record their product on this record.

Weston Corp. Develops New Photoelectric Cell

ANew photoelectric cell, to be known as the Weston Photoelectric Cell and said to be different in construction, utterly simple and yet low in cost, has been announced by the Weston Electrical Instrument Corp. of Newark N. J.

The new cell, it is declared, employs a highly light sensitive disc which transforms light energy directly into electrical energy without the use of any auxiliary voltage. Its response to light variations is instantaneous and sufficient current is developed to operate directly Weston relays without the use of auxiliary apparatus or any battery. It delivers about one microampere per foot candle of light intensity. When exposed to direct sunlight the output is approximately 5 milliamperes. The cell resistance from about 1,500 ohms for 10 foot-candles light intensity to about 300 ohms for 240 foot-candles intensity.

Enclosed in a moulded black bakelite case $2\frac{1}{4}$ inches in diameter and one inch in thickness, the new cell is fitted at the bottom with two connection prongs which fit into the standard UX radio tube socket. It is rugged in construction and is so simple in design that there is nothing to get out of order, the company claims.

Western Electric in Soldier's Home

TWO Western Electric Sound System installations will furnish talking picture entertainment for inmates of the National Military Home at Washington, D. C., as the result of contracts signed recently according to C. W. Bunn, General Sales Manager of Electrical Research Products. One installation will be made in Stanley Hall and the other in the hospital building.

EVERY SOUND ENGINEER SHOULD READ THE
CINEMATOGRAPHIC ANNUAL

The Greatest Authorities on the Subject have written on Sound in this book.

Laboratory Department

Conducted by EMERY HUSE, A. S. C.

Principles of Sensitometry and Their Practical Application

Part 8

IN THE just preceding articles of this series the general subject of exposure was dealt with and included a definition of a sensitometer, followed by a detailed discussion of light sources. The light source is the most essential element in exposure but a necessary adjunct to it is some device, mechanical or otherwise, which must be capable of producing a series of definitely known exposures. Such devices are referred to by L. A. Jones as "exposure modulators."

The subject of exposure was dealt with in some detail in Part 4 and the general formula

$$E = I \times t$$

was fully defined. It is evident from this definition that exposure is made up of two elements, either of which may be varied. Exposure modulators, or sensitometers, may be classified then in terms of the manner in which the control of exposure is accomplished. If the illumination, "I", is variable, "t" being constant, the resultant series of exposures is referred to as an **intensity scale** series. If the time, "t", of exposure is variable, "I" remaining constant, a **time scale** series of exposures is obtained. As a result of these two variables, sensitometers have naturally fallen into the two definite classes of intensity scale and time scale instruments.

At the present time the motion picture industry makes use of both types of sensitometers, although the newer methods of control are making increasing use of the time scale type. Before going into details regarding the practical methods of the motion picture industry it would be well to discuss at some length the evolution of sensitometers. This discussion will be given in two sections based on the manner in which the exposure is made, one dealing with intensity scale methods and the other with time scale.

INTENSITY SCALE INSTRUMENTS—Intensity scale instruments may be grouped into two separate classifications in that the variation of exposure from point to point may be continuous or discontinuous, thus giving after development of the exposed photographic material, a silver deposit which shows a continuous change in density or one which consists of a series of distinct steps. Intensity scale instruments of this latter type are made use of in the motion picture laboratories to some extent and are usually referred to as "step tablets."

Probably one of the first of these intensity scale sensitometers consisted of "tablets" constructed in various ways. These were made use of by placing them in contact with the photographic material to be tested in some suitable light tight box and exposed to a standard light source for a fixed time. Probably one of the first sensitometer tablets used in the testing of photographic plates consisted of tablets made up by superposing an increasing number of layers of tissue paper in such a way that the illumination reaching the sensitive surface was controlled in an approximately known manner. The various steps in these tablets were numbered in such a way that the number printed through. By observing the highest number which would print through, the worker could, to a certain degree, test the speed of the photographic material which was being used. It can be seen, after consideration of present day methods, that this was an extremely crude procedure.

L. Warnerke used an intensity scale type of tablet which consisted of a plate glass approximately $3\frac{1}{4} \times 4\frac{1}{4}$ in. on the

surface of which were located 25 squares increasing in density by supposedly equal increments. These squares were formed by making a cast in gelatin from an original dye produced by superposing sheets of paper, the casting method being used that is known in photography as the Woodbury type. The various areas were numbered consecutively by means of superposed opaque numbers. The proportion of black pigment admixed

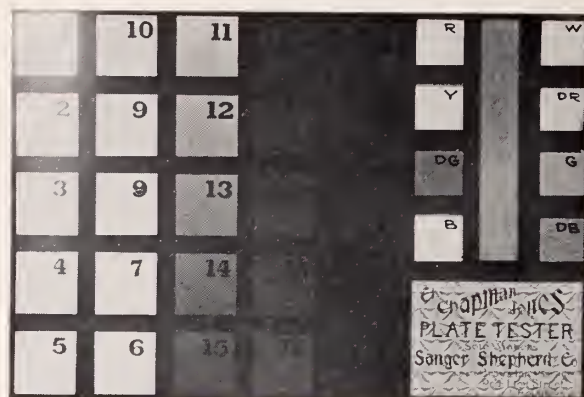


Fig. 1.

in the gelatin was supposedly so adjusted that an increase of three numbers on the tablet represented a decrease of light intensity of 50%. Tablets made according to this rule did not approach the ideal with anything like the desired precision.

A later revival of the Warnerke tablet is found in the photographic plate tester of Chapman-Jones. This tablet was made in a similar way, the square areas on the left hand side of the plate being neutral gray absorbers of different degrees of transparency, while the right hand side of the plate contained colored gelatin sections through which it was possible to get an approximate idea of the color sensitivity of the material tested. However, tablets of this type could not be manufactured to agree with one another. A single tablet used for testing could be considered quite good. Figure 1 shows a sketch of a Chapman-Jones tablet.

Tablets of a similar principle have been more recently devised but most tablets have the disadvantage of being difficult to repeat in manufacture. In general this type of exposure mechanism is not very satisfactory owing to difficulties in reproducibility, permanency and precision in exposure gradient. It is almost impossible to find a material which is sufficiently non-selective so that visual calibration of these tablets can be assumed to hold for photographic materials which are sensitive to an entirely different range of wave lengths than is the eye.

R. Luther suggested an ingenious device consisting of two neutral gray wedge tablets superposed with the axes of density gradient at right angles to each other. Each neutral gray wedge is square so that the two fit over each other giving a square sensitometer tablet which modulates the intensity of exposure in two directions at right angles to each other. When a photographic material which has been exposed behind this tablet is developed the dense area outlines approximately the D-log E characteristic curve of the material. A sensitometer of this type has certain advantages where rapid means of testing

(Continued on Page 42)

What's What in Make-Up

In the November issue Mr. Max Factor, internationally known make-up expert, discussed the proper application of make-up. In this article Mr. Factor takes up the basic principles of character make-up. —Editor's Note.

• Let us start by defining the word "character" as it applies to the acting profession. It is the representation of a particular personality, and impersonation, if you will, as interpreted by an actor. And he is a great actor only insofar as he creates in his audience that necessary "suspension of disbelief." He must look like an actor. He must look his part. And he does this by making a careful study of every phase of it. If the character he is to play is not vividly clear to him he will seek out authentic sources,—examine pictures, read descriptive material, and he may observe his model in real life . . . in the mines, the Ghetto, or wherever his problem takes him.

It is an erroneous notion that "any old way" will do in making up. The art of make-up is full of details, and to be slipshod about any of them may entirely affect the success of a performance. Good make-up creates an illusion, but there is no illusion about a poor make-up. No matter how far back you are from the camera, or how unimportant your part, it is not good business to try to fool your audience with poor make-up. True, the work calls for studied detail, but on the motion picture set there is nothing trivial about details.

High Lights and Shadows

In make-up this is an art that employs only light and shade, an arrangement or treatment of light and dark parts, to produce a harmonious and effective characterization. High lights are contrasting shades, skillfully blended with the foundation color of the complexion. Every dark line that is drawn on the face should be high lighted with a much lighter shade, and the edges must be properly blended with the complexion.

High lights are used to give prominence to the nose, cheeks, chin and wrinkles whenever it becomes necessary, in creating a particular character. To high light these features, use a lighter shade of make-up than the ground tone that is being used on the rest of the face. For ordinary high lighting use a shade three or four times lighter than the base. For extreme high lighting, use white or yellow lining colors. To make shadows or low lights use colorings of a darker shade than the ground tones of the complexion. In straight make-up shadows can be used to offset features that are out of pleasing proportion. In special character make-up, shadows are employed to produce sunken features by blending them with high lights.

To sink or hollow the cheeks and temples use shadows of gray or brown, high lighted with contrasting white or yellow, and blending the whole into the ground color. In most cases, in making low lights, do not use black. Use grey, maroon or dark brown.

The Nose

While there are significant differences in the proportions of the nose among different types of people, it might be helpful to know the general standard of proportions accepted by most sculptors and portrait painters, as follows:

1. The length of the nose must be equal to that of the forehead.
2. A front view of the nose should give the arch a little more width near the middle.
3. The point must be neither round nor fleshy. The lower contour, precisely outlined, neither narrow nor wide.
4. The flanks must be seen distinctly.

5. In the profile, the lower part of the nose should be only one-third its length.
6. The sides of the nose form a wall.

When these proportions are required the use of high lights and shadows will give the effect. To make the nose thinner and more prominent use a high light on the bridge of the nose of a much lighter shade than the ground color of the complexion, carefully blending the sides with gray shadow or red brown.

To tilt the nose upward use brown shadow in a triangular shape underneath between the nostrils.

The Eyes

In the eyes we can read many human emotions—sadness, hope, fear, defiance, anger, wistfulness, contemplation. Further, the characteristics of the eyes—the shape, color, setting, eye-brows—indicate types of personality. The eyes can be made to appear offensive or unfriendly if they are set too near or far apart. The arrangement of the eyebrows should be in accordance with the desired effect.

Sunken eyes may give a threatening or sombre look, depending on how the sunken effect is treated with relation to the other features of the face. To make the eyes appear larger draw a line with the dermatograph pencil around the upper and lower lids. This line must be drawn a reasonable distance from the lash lines, allowing the skin to be visible. The effect is best achieved at the outer corner of the eyes.

The Mouth

The mouth may be called the most sympathetic part of the face. Its mobility makes it readily responsive to our innermost feelings; indeed, the mouth sometimes betrays our deepest thoughts. With the eye it makes up a language that is unmistakably communicated.

In making up the feminine lips the width and the cupid's bow should be in pleasing proportion to the other features. To achieve this, sometimes the natural lip lines may have to be concealed. This is done by applying lip rouge, forming the desired shape and size, then carefully spreading the ground color with a tinting brush to the edges of the new lip line. To hide line of demarcation or impression of such, pat the complete surface of the concealed line with the index finger.

Men, in applying lip rouge, must avoid the appearance of a cupid's bow. Strange to say, this is often overlooked. If one lip is more prominent than the other, use two shades. A dark shade to subdue the prominent lip and a bright shade to accentuate the other.

A jovial, good-natured expression is effected by tilting the ends of the mouth upward. A worried, haggard, painful expression is made by drooping the ends of the mouth.



Minneapolis Pantages Becomes United Artists

UNITED ARTISTS has taken over the Pantages, Minneapolis loop house that has been vacant for some time. House will be called the United Artists and W. H. Rudolph of New York is manager. Austin McGough, division exploitation manager, aided in the deal.

Bell & Howell Builds in Hollywood



• ONE OF THE MOST attractive buildings in Hollywood is the new Hollywood home of the Bell & Howell Company at 716 North La Brea Avenue. The building is the last word in completeness of equipment and quiet beauty of design and furnishings.

It is sincerely hoped by Bell & Howell officials that both amateurs and those engaged in the various divisions of the professional motion picture industry will take full advantage of the really fine facilities offered at 716 North La Brea Avenue. The eighty-seat theater and its projection booth will be fully equipped for showing sound or silent 16 mm. or 35 mm. films, and will be at the disposal of Bell & Howell customers and friends, as will the three smaller projection rooms and the room which is fully equipped for 16 mm. film editing. Among others, Filmo using travelers visiting the film producing center will find these facilities most welcome.

Both professional and personal motion picture equipment will be displayed and serviced in this building. An engineering department, thoroughly supplied with every necessary instrument, will operate as a branch of the famous Bell & Howell research, experimental, and engineering department at Chicago which, incidentally, has just had its quarters enlarged approximately 50%. A most modern motion picture machine shop will provide for servicing 16 mm. and 35 mm. equipment and for building special cine machinery. Lens testing, setting, and repairing will be taken care of by a fully equipped optical department.

All in all, the new building, together with its equipment and personnel, will permit Bell & Howell's Hollywood branch to render the highest type of service in both amateur and professional motion picture fields.



The spacious reception room in the new Bell & Howell Hollywood plant

YOUR OPPORTUNITY!

The AMERICAN CINEMATOGRAPHER now offers the greatest opportunity ever given the AMATEUR MOVIE MAKER to win recognition and cash. A total of **\$1,000.00** in **CASH** prizes is offered by this magazine to the winners of the Amateur Movie Making Contest announced in the October issue. This contest is sponsored by the American Society of Cinematographers, an organization composed of the world's leading professional motion picture cameramen. If you want to win recognition, as well as cash, read the rules below and send your entry :: :: :: :: :: ::

COMPLETE RULES OF THE AMATEUR MOVIE MAKING CONTEST

The American Cinematographer will present a prize of \$500.00 for what its judges consider the best 16 millimeter picture submitted in this contest. \$250.00 will be given as second prize; \$150.00 as third prize; and \$100.00 as fourth prize, a total of \$1000.00 in prizes.

This contest is open ONLY to AMATEURS. No professional cinematographer will be eligible to compete. It is a contest solely for the amateur, either the individual or the club.

The contest officially opens November 1, 1931. The contest ends at midnight of October 31, 1932. All pictures must be entered by the closing date or they will not be considered. Entries mailed or expressed bearing the date of sending will be accepted if they reach THE AMERICAN CINEMATOGRAPHER office after October 31, 1932, providing the date shows they were sent before midnight of October 31, 1932.

Pictures submitted in this contest will be judged upon photography, composition, direction, acting, cutting and entertainment value. And only silent pictures will be eligible for the contest. The judges, whose names will be announced later, will include outstanding and widely known Cameramen, Directors, Actors, Writers and a group of nationally known Motion Picture critics from some of the best known newspapers in America.

The decision of the judges will be absolutely final, and there can be no appeal from their decision. Announcement of the awards will be made as soon after

the close of the contest as possible and checks will be mailed the winners.

Pictures may be submitted either by individual amateur movie makers, or they may be submitted by Amateur Movie Clubs. However, they MUST BE photographed on 16 millimeter or 9 millimeter film. Accompanying each entry must be a sworn statement to the effect that no professional cinematographer assisted in the making of the picture. No pictures will be accepted which were photographed on 35 millimeter film and then reduced to 16 millimeter.

This contest is open to amateurs and amateur clubs anywhere in the world, with the following conditions.

Only Bona Fide Subscribers to the American Cinematographer Can Compete

If you are a paid-up subscriber to THE AMERICAN CINEMATOGRAPHER you are eligible to enter the contest. If you are not a subscriber just send in your check for a year's subscription and you are eligible.

In the case of Amateur Clubs the following rules apply:

If a club with a membership of 20 or less wishes to enter a picture, the club will have to have a minimum of 5 subscribers among its members. Any club with more than 20 members will have to have a minimum of 10 subscribers among its members. For any further information you may desire, write the Editor of the American Cinematographer, 1222 Guaranty Building, Hollywood, Calif., or consult your photographic supply dealer.

IF YOU WISH TO ENTER THIS CONTEST AND ARE NOT A SUBSCRIBER, MAIL COUPON TODAY

American Cinematographer, 1222 Guaranty Bldg., Hollywood, Calif.

Enclosed please find Check, or Money Order, for \$3.00 (\$4.00 foreign) for which kindly enter my subscription to THE AMERICAN CINEMATOGRAPHER for one year:

Name.....

Address.....

It is understood that this subscription makes me eligible to enter your \$1000.00 Amateur Movie Contest.

Amateur Movie Making

by HATTO TAPPENBECK, A. S. C.

THE FUNDAMENTALS of photography are the same in still work as in motion pictures. The theory of these underlying principles can be obtained from the many books written on photography and its art. The manipulation of the camera, whether it be for stills or movies, is quite readily acquired from the pamphlets and instructions furnished at the time of its purchase.

The more practice with the camera, the easier the handling will be and the better the results. But the taking of the picture is only one step towards the finished product. Many times the photographer is dissatisfied with the result of his efforts. The subject was there, the camera was handled right, but the picture or film is a disappointment. On the other hand sometimes we take a "shot" at a subject, just for remembrance sake or for a mere record of the locale or object, and in spite of our more or less indifference in handling the camera we get the surprise of a perfect picture.

This shows what great possibilities there are in photography and cinematography, if we know how to tackle them. And this is only possible by a thorough practical knowledge of ALL the phases our film and prints go through from the time we take the picture until we have the finished print. This necessary knowledge CANNOT be acquired out of books, but must be learned by practical experience in the darkroom.

I am not actually advising every 16 mm. enthusiast to go ahead and build a darkroom, install machinery, and process his own 16 mm. films. On the contrary, there is too much expense and work connected with the development of the long strips of film as to try to handle them at home.

However, I mentioned before that the fundamental principles involved are identically the same for motion picture and still photography. Therefore we may apply the problems arising in the one to the other, and vice versa. There are countless ways in which still photography will improve the motion picture work in addition to providing a good pastime as well as an interesting study. A small, convenient darkroom may be installed and equipped at very little expense and will pay well for the time spent there.

The ideal still camera for such an enterprise is one which takes the standard motion picture film, thus enabling one to experiment with the fast emulsions now used in the movie camera. The expense of film is negligible even if a large number of pictures is taken. This gives the opportunity to photograph the same scene several times with different exposures, stops, or filters. A comparison of the negatives with each other and the corresponding notes taken at the time of making the shots will disclose valuable data for future use.

In most cases the film nowadays has enough latitude to give a printable picture at any halfway normal exposure. But there is only ONE correct exposure for certain results wanted, be it soft and diffused or contrasty and sharp. The real value of such tests lies in the possibilities of getting effects. A good picture requires a certain mood, a certain effect to express truly what it is meant to portray. Oftentimes a filter of some kind will add this final touch, which makes the picture an outstanding one, different from the others, more pleasing.

It is quite possible to make or buy a set of filters and to provide a suitable filterholder which will adapt the one set to both, still and movie cameras. With the aid of a good photometer or a little computation the identical results from the still may be secured on the movie film.

Still photography and the printing of stills give valuable hints on exposure and development which can change the whole character of the picture from a merely commercial product to a work of art. If you do your own developing, etc., you will find that the close contact with the picture throughout all phases from its conception up to its finish gives a more powerful and lasting impression as to its merits and faults.

The chemistry is an interesting part of photography in itself. Besides that it helps materially to define the condition and the treatment of the negative and print. Good results as well as faulty ones are often due to the laboratory work. But in quite a number of cases too much is expected from the cameras and film material we have to work with. They have their limitations too with which we can get acquainted only by actual trial and experience, and with which no laboratory is able to cope, once the exposure is at fault.

Ordinarily one has very few chances to know the working methods of the laboratory where the 16 mm. film is being processed. A still taken at the same time, speed, stop, with the same emulsion, etc., does much to reveal the film's development and requirements in the way of a perfect exposure. A close comparison of the still negative with that returned from the laboratory may lead to great improvements in the quality of the 16 mm. film.

Last but not least the making of still prints will contribute to the rapid development of a sense for composition. As the smaller contact prints do not lend themselves so readily for judging the same, it is advisable to enlarge them. In projecting our 16 mm. film we do the identical thing; we enlarge the image, incidentally producing better detail and gradations in the shadows.

A good, small enlarger creates not such a problem anymore as it did a few years ago. There are many suitable and inexpensive makes to be had. In enlarging the picture one may already try for composition by using only part of the original negative. After all, composition is nothing else but a pleasant arrangement of the photographic matter. In the camera we have the means of telling a story. We can make it a good or a bad one from an artistic viewpoint according to the composition which may be pleasing through its harmony or distracting through the shattered disarrangement of the whole.

Of course, the proportion is fixed for the 16 mm. film. Its actual picture dimensions 8x10.5 mm. give nearly a 3x4 proportion which is very agreeable to look at on the screen. It should not be difficult to arrange a good composition for it. Oftentimes an interesting action makes us overlook the environments, but that does not mean that in such a case good composition was unnecessary. How much more pleasing would the whole picture have been, had the acting been laid in a more fitting place, or if the background itself had been well chosen? It would have helped to direct the thoughts towards the action rather than to avert them by too great a contrast between the principal subject to be photographed and its immediate surroundings.

This should be particularly observed in close-ups where a too prominent background can be very distracting. Special attention has to be paid to lighting the close-ups in the film. The study of stills made from different poses of the subject will indicate the vital points of the motion picture lighting. We are dealing in reality with a series of successive portraits. Therefore the light should be so arranged that the person in

(Continued on Page 42)



A Filmo for Christmas

...the gift that is worthy
of the spirit behind it



Life-size, theater-clear, theater-brilliant home movies are shown with the new Filmo Model "J" Projector.

FOR photography-minded people, there is little question about the movie camera or projector to give for Christmas. Filmo, of course, is the choice of those who know.

And why? First, you have the simplicity of taking movies for which the Filmo Camera is famous. "What you see, you get" . . . down to the last detail, with the clarity and the brilliance and superb photography you would expect only from a professional movie camera. And it's only natural that Filmo give movies of professional quality, because it is made by the same master craftsmen who make the internationally famous Bell & Howell Studio cameras used by the major film producers of the world.

And when Filmo movies flash on the screen there you see the undeniable proof of the superiority of the Filmo Projector—movies so brilliant and clear that you miss not the tiniest detail, movies steady and flickerless.

Can you think of a better gift than personal movies, or better equipment to take and show these movies than Filmo? Do not be misled by price tags. Bell & Howell equipment is in no sense expensive, for it is built not only to produce the finest of personal movies but to last forever. *No Filmo has ever worn out!*

Go to your dealer's today. Ask him to demonstrate Filmo for you, or write us, if you like, for interesting Filmo literature.

Bell & Howell FILMO

BELL & HOWELL COMPANY, 1848 Larchmont Avenue, Chicago, Illinois
New York, Hollywood, London (B. & H. Co., Ltd.) *Established 1907*



The new model "J" projector

This is the new 100% gear driven Filmo Model J Projector that automatically rewinds your film, with a new and powerful optical system that passes 30% more light than ever, with automatic pilot light that makes threading so easy, a new tilting device, illuminated voltmeter, radio interference eliminator, and other refinements that make it the outstanding advance in 16 mm. movies. Price, complete with case, \$297; fully equipped for Kodacolor, as well as black and white, \$332.



The Filmo 70-D Camera

Below is the Filmo 70-D Camera, still the undisputed master of all personal movie cameras. It has a three-lens turret head, enabling you to switch from one lens to another in an instant. Its seven film speeds give you the slowest of s-l-o-w movies and the fastest, too. Its variable view-finder automatically frames your picture, regardless of the focal length of the lens. Prices, \$245 and up with Mayfair Case. Other Filmo Cameras from \$92 and up. The Filmo 75 Field Model Camera, equipped with Kodacolor filters and speed lens at \$149.50, is the lowest-priced Kodacolor-equipped movie camera you can buy.





1 and 3. Streets in Auray. 2. A "rouet a filer." 4. Auray from the estuary. 5. Auray bridge. 6. The oldest. 7. The youngest. 8. The most prolific.

Babbling About Brittany

by LAWRENCE GRANT

This is the ninth and concluding article of this unusually interesting series which Mr. Grant has written for this magazine.—Editor's Note.

THE HYMN of the Brittany Peasants Pilgrimage to the Grotto of Our Lady of Lourdes, where the little shepherdess Bernadette Soubirous saw the vision of the Virgin Mary, a hymn which is now used at every "pardon" in Brittany, as well as in Catholic churches the world over, epitomizes Brittany and the Breton character more clearly, more completely and more perfectly than any written page can do, even though Anatole le Braz who knew more about the Bretons and their country than anyone else, were the writer.

Litany of Lourdes.

ly - mac - u - late Ma - ry! Our hearts are on fire,
That ti - ble so won - drous, fills all our de - sires! A -
ve, A - ve, A - ve, Ma - ri - a! A -
ve, A - ve, A - ve, Ma - ri - a!

They are saturated, in the full dictionary meaning of the word, which is,—as much as can possibly be absorbed—with religion, and with tradition.

But like the Litany their faith is not flat, nor their religion dull. It has an aesthetic quality, this faith of theirs, it has a poetic imagery and a musical lilt to it, this devotion which sways them all so strongly, young and old, grave and gay.

That's it. Gay. They may say themselves that they are Bretons first and French afterwards, but they have a gaiety, a resilience, a charm, and a good humor that proves them unmistakably French. They laugh.

"One touch of nature makes the whole world kin"

But

"One touch of **humor** makes the whole world **kind**."

Laughter is the gift of the Gods. He who can laugh, or respond freely to another's laugh is full of riches.

It is a child's most endearing attribute.

"If the golden crested wren
Were a nightingale—why, then,
Something seen and heard of men
Might be half as sweet as when
Laughs a child of seven."

As a matter of fact it was laughter that gained for me the privilege of making a motion picture, for the first time in history, of Pontifical High Mass.

It was at this the most famous of all "Pardons" of St. Anne d'Auray, which takes place 25th and 26th July each year. I went over from Auray on the 23rd to select such spots as seemed suitable for cameras, etc. and to get other advance information. I found a Priest decorating the altar of the outdoor church, but from him I got no information, scarcely courtesy, and when I mentioned a camera he became absolutely morose. I went further and found the Father Superior a delightful person, wearing as he came out of his house his long black priest's cassock, but on his head a soldier's red peaked cap! This was the first time I have ever encountered such a combination, though at Quimper Cathedral I had seen a priest kneeling before an altar with spurs sticking out of his shoes, his uniform being under his church robes! You see this war was the first time that priests had been made combatants.

This priest-soldier was delighted to give me all information about the services and where they would take place, but when he found I had a "cinema" with me, he too, changed his attitude. It was impossible. There were to be three Bishops for the celebrations of all the services, and the Archbishop of Nantes, Monseigneur du Parc, objected strongly to any religious ceremony being shown on the cinema.

"Could I meet him?" "Certainly, tomorrow he would be here."

I met him, I talked to him, I explained to him that I was to take these pictures back to America, where I hoped many Catholics would see them and observe how beautifully the various ceremonies were conducted in this old world fashion. I told him how little of the old there was in the States, with the exception of a few missions in California, everything new. New Cathedrals, new vestments, new architecture, and, with a smile I added, "I even suspect some of the relics as being new." He was a delightful old man, and he laughed at this, and I thought if you laugh you are beaten. In the end I stayed to lunch, he himself came out to show me where and how he thought I should place my cinema, and after the procession had passed he told me that if I was quick I could pick it up again at another spot where he and the other Bishops would give the benediction in front of the lens in a close up. All this I subsequently got. Alas, only in "movie". Then said he: "You may take some feet of the Mass provided you give me your word of honor that you will not photograph such portions of it

as you know I would not wish you to record." And with promise I not only obtained permission, but I found he knew that a telescopic lens would be needed to go over the heads of the crowd and he himself came and discussed this as well.

These "pardons" of Brittany are hard to describe, at least exactly why that name has been attached to them. It would seem originally that in addition to the usual weekly or monthly confession and absolution, this yearly gathering was in the nature of a grand confessing and pardoning which should clean up the whole past year.

Even cattle were absolved from their misdeeds in the old days, and blessed for the future. Today they are still brought in to many pardons and blessed, noticeably at the pardon of Our Lady of Light at Baud, and a certain percentage of their increase during the year is turned into the Church in return for this received blessing.

Among so much that is lovely, picturesque and full of genuine and beautiful devotion it is upsetting to find so much that is sordid and commercial. At every pardon this crude commercial element enters. Here, at Auray, round the entire enclosure of the great Basilique are the "boutiques" selling wax candles, and rosaries, and images, and sometimes other more secular articles which are supposed to add to the gaiety of any celebration, just as we have trumpets and teasers for New Year's Eve. But it jars with this atmosphere.

I remember being horrified at Lourdes in the Pyrenees. They had adapted electricity to religious statuettes, by placing a small light bulb *inside* the figure which was of semi-transparent milky china. And in various small shops which line the main street, you read:—"Buy our transparent Virgins, the only genuine."

So I find all this commercialism very annoying, and cannot help wondering whether the Great Founder of their Faith would not do a little modern scourging from the Temple of this kind of people if He came back among them.

But the spirit and the devotion and the faith and the picturesque appreciation which every peasant seems to have, rises triumphant over all that is tawdry and modern and cheap and hideous. It even is oblivious of the hideous modern architecture of the Basilique, which is frightful. Dear old "Guide Joanne" says:—"La basilique, reconstruite de 1866 a 1873, est un grand monument en **pseudo-style** de la Renaissance, et **d'un art mediocre.**"

However, all is well, for on the other side of a narrow street is a delightful oblong garden, perhaps 100 yards long, with an altar built high up above all heads, and approached by a stair case on either side, the "Scala Sancta," and here unless the weather is unfavorable, all the principal ceremonies take place during the two day pardon.

The "Scala Sancta" has other uses besides that of permitting the access to the altar space by Priests and choir. On these steps you may expiate your offences for the past year. To do this you must start **on your knees** at the bottom step, and praying as you go, go all the way up and all the way down still on your knees! And if you are not thereby forgiven for what you have done, you will at least carry the memory of your penance for some time as a restraining influence against future offence.

To this, one of the great pardons, (another is St. Anne de la Palude) peasants will come from all over Brittany, and you will probably see more varieties of caps in a single day than on any other occasion, and during the afternoon, after the ceremonies, will be gathered the most beguiling groups here and there all over the grass of this outdoor church with their picnic lunch, **with wine**, for without wine no meal would be the slightest good in France, other groups round the great fountain, and others round the front of the little Inns and restaurants, and all with such gaiety, such simple gaiety and such delightful bonhomie as I have never encountered among any other people. Especially the women and the girls. It seems to you that I have harped on the female of the species in these chap-

ters, but I am not influenced by the charm of the youth or the beauty of them, though such there is aplenty, but by their ability and the qualities of capability. During the war they were France's props and bulwarks and now since the war they are France's hope, for to them they must look, mustn't they for the future generation of babies that have been coming on since 1918. The hand may have forgotten how to rock the cradle elsewhere, but the peasants of France, where they have for years been wise enough to see that the cradle does not get over crowded or over used, at least can rock that cradle efficiently and instil their own good qualities into the little minds of the little bodies they are rocking.

The great processions at these ceremonies are really splendid, with the vivid scarlet cassocks of the choir boys, the gorgeous copes and dalmatics of the Priests, the marvelous colors of the embroidered banners, the golden treasures from the church, the statues, always colored and sometimes, as here at St. Anne, of pure gold leaf, together with the caps and the gay costumes of the crowd make an impression on the eye never to quite forgotten.

But again all this would make but a passing impression, if it were not for the surrounding atmosphere of sincerity and gay good humor.

Perhaps character is much affected by climate and living conditions, for about the only people who are less gay than usual are those who come from the Ile de Sein where the climate is fearful, and which is isolated from the main land for considerable times owing to weather conditions making it impossible for any one to approach the island.

Here is a place where character and even appearance is not affected solely by climate, but also by surroundings and superstitions and traditions.

The Ile de Sein has been mysterious at one time, evil at another, and wild and barren, and rocky and rough all the time.

In the days of the Cromlechs and the Menhirs it was an important Druid gathering place. There lived Teutates, a wild sorcerer with nine sacred Druid Virgins, who, for those who had the courage to cross the tempestuous waters from the mainland to visit them, would give divinations and foretell their futures. It was a burying place for Druid Priests who were brought from the mainland to their last resting place through the Baie des Trepasses, (the Bay of Those Who Have Passed On) and according to Breton tradition the souls of shipwrecked sailors still haunt its barren lands at night, knocking and crying at the cottage doors till their bones shall all be found on the shore, and demanding burial for them.

No wonder the islanders were thus haunted, for in later years no sooner had the fear and superstitions of dead Druids begun to die down, than certain fisher people from the mainland made their homes on the shores, ostensibly for fishing, but in reality they found a far more profitable, though villainous way of making a living. They became "wreckers" by profession. The wind and sea, rough and dangerous as they were, did not bring in a sufficient number of wrecks to satisfy their greed, so they would tie torches on the heads of cattle and let the cattle run wild about the island at night, thus luring vessels, already in trouble in the fogs and heavy seas, to their destruction on the rocky shore.

Today fish is plentiful, and fishing is their means of livelihood, but still the coast is so dangerous that gathering wrecked loot from the shore which is sold by auction legally in the little town adds considerably to their small incomes.

Whatever they get is obtained at a price few would care to pay. The climate is abominable, the sea rough, the rain frequent and severe and the wind becomes a tempest.

They are isolated from the rest of the world, their land will grow nothing but potatoes and barley, they are dependent for food on bringing it from the mainland when the weather per-

(Continued on Page 47)



1. Open air Mass at St. Anne. 2. The Basilique. 3. S.R.O. sign at the Basilique. 4. Here they come. 5. The Scale Sancta. 6. Returning from Benediction. 7. Women from the Ile de Sein.

Hollywood Callboard

As this issue goes to press the following production activities were under way in the Hollywood Studios.

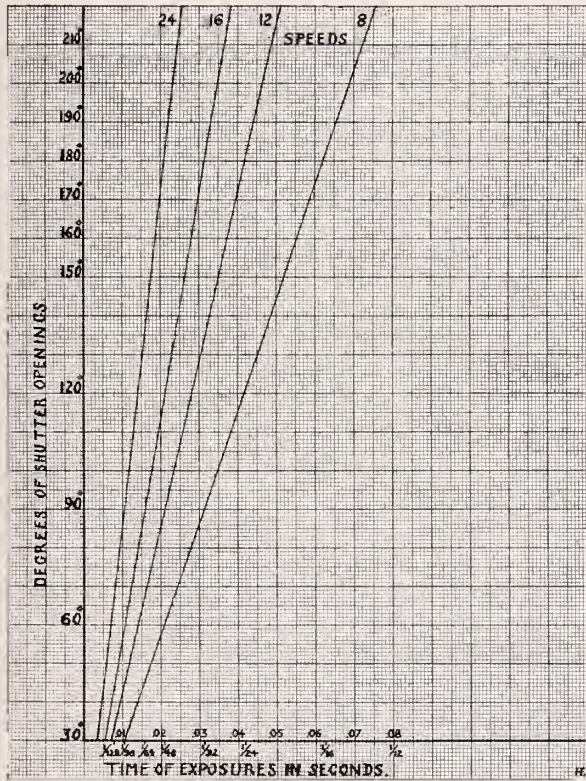
STUDIO	STAR	DIRECTOR	ASST. DIR.	CAMERAMAN	STORY	SCENARIST
COLUMBIA	All-Star Jack Holt O'Brien-Clarke	Roy W. Neill John F. Dillon Howard Higgin	Gene Anderson Dave Selman C. C. Coleman	O'Connell Teddy Tetzlaff Joe Walker	"The Feathered Serpent" Untitled "Final Edition"	Uncredited
DARMOUR	All-Star	Phil Whitman	J. A. Duffy	John Brown	"Air Eagles"	Uncredited
FOX	All-Star James Dunn Watkins-Kirkland McLaglen-Mack O'and-Watkins	Seymour Felix Sidney Lanfield Wm. C. Menzies Alan Dwan John Blystone	Jack Boland C. Woolsten- hulme Walter Mayo E. Rettig Jasper Blystone	G. Schneiderman James Howe John Mescall G. McWilliams	"Stepping Sisters" "Dance Team" "Circumstance" "While Paris Sleeps" "Charlie Chan's Chance"	Howard Comstock E. Burke Andrew Soutar Woon-Dwan Connors-Klein
INTERNATIONAL STUDIO	Big 4-King-Barton Tyron-Reynolds	J. P. McGowan Frank Strayer	Wm. Nolte Art Black	Ed. Kull Jules Cronjager	"Human Targets" "Passport to Paradise"	Geo. Morgan Scott Darling
METRO-GOLDWYN-MAYER	J. Weissmuller Jackie Cooper All-Star Marie Dressler All-Star Robert Montgomery	W. S. Van Dike Harry Pollard Chas. Brabin Clarence Brown Tod Browning Robt. Z. Leonard	Arthur Rose Unassigned Red Golden Chas. Dorien Earl Taggart Harry Bouquet	Hal Rosson Unassigned N. Brodine Oliver Marsh M. Gerstad Geo. Barnes	"Tarzan" "Limpy" "City Sentinel" "Emma" "Freaks" "Courage"	Wm. Johnson Brabin-Mahin Vicki Baum Goldbeck-Gordon Fred. Lonsdale
PARAMOUNT	Dietrich-Brook- Wong Cooper-Coogan Chevalier- MacDonald Holmes-Hopkins Brook-Holmes All-Star All-Star	Josef von Sternberg Norman Taurog George Cukor Wm. C. DeMille Ernest Schoedsack Lloyd Corrigan Frank Tuttle	Ed Martin A. Jacobson Geo. Hippard Russ Mathews Unassigned Jack Mintz Robert Margolis	Lee Garmes Arthur Todd Victor Milner Karl Struss Rex Wimpy Charles Lang Henry Sharp	"Shanghai Express" "Sooky" "One Hour With You" "Two Kinds of Women" "Lives of a Bengal Lancer" "No One Man" "Second Chances"	Jules Furthman Jones-McNutt S. Raphaelson B. Glazer DeVino-Buchman Heath-Buchman- Leahy Jos. Mankiewicz
R.K.O.-PATHE	Bill Boyd Ann Harding Constance Bennett	Albert Rogell Tay Garnett E. H. Griffith	Frank Shaw Robt. Fellows E. J. Babelle	Ted McCord Lucien Andriot Hal Mohr	"Bad Timber" "Prestige" "Lady With a Past"	Jackson-Ryan Graham John Austin Parker
TEC-ART	Allied Pictures Willis Kent- Chandler	Chester Franklin Mandy Schaefer	Wilbur McGaugh Buddy Shyer	Harry Newman Bill Noble	"File 113" "Sagebrush Romeo"	Uncredited Oliver Drake
WARNER BROS.-1ST NAT'L	Lil Dagover Winnie Lightner Fairbanks-Blondell Wm. Powell	Michael Curtiz Lloyd Bacon Alfred E. Green Mervyn Le Roy	Joe Barry T. C. Wright Al Alborn G. Hollingshead	Ernest Haller Dev. Jennings Sol Polito Robert Kurlee	"The Captain's Wife" "Manhattan Parade" "Union Depot" "High Pressure"	Thew-Mandel- stamm Lord-Branch Nicholson-De Leon O. Garretson

Shutters in 16 mm. Cameras

ONE of the outstanding differences in design between the professional 35 mm. and the 16 mm. camera for the amateur is in the construction of the shutter.

The former has a movable shutter which may be operated at any opening from 0° to 170° or 180°. At the same time it provides an automatic dissolve for "fade in" or "fade out".

The shutters in the 16 mm. cameras are built much simpler. They have a fixed opening, which makes fades impossible, and leaves the entire control of exposure up to the lens stop. However, this does not mean that all the shutters on cine cameras have the same opening.



Exposure Chart

The following table gives an idea of the approximate degrees of shutter opening for various 16 mm. cameras:

Filmo 70	210°	Filmo 75	170°
De Vry, 16 mm.....	180°	Cine-Kodak	170°
Cine-Nizo	180°	Agfa-Ansco	110°
Victor Cine Camera	170°		

It may be seen that the difference in exposure for these cameras is sufficient to produce various results under otherwise identical conditions. The equivalent time of exposure for the above cameras may be readily taken from the accompanying chart which is computed for the four camera speeds most widely used in ordinary work. The exposure time is given in 1/100 parts as well as in other fractions of a second, which may be found on the many exposure or photometers now on the market. This is done to adapt any exposure meter, even those intended for still work alone, readily to the requirements of the 16 mm. worker.—Hatto Tappenbeck, A. S. C.



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* Exhibited: London Salon, Royal Salon, Paris Salon, Madrid, Barcelona, Warsaw, Pittsburgh, Toronto, Edinburgh, and Los Angeles. His work in addition to that listed above, appears constantly in national advertising pages. A complete showing of Mr. Connell's work is now on exhibit at the school galleries.

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In the Art Director's Field

ONE of the most important elements in the making of motion pictures is the designing of the sets. Various art directors have various methods which they follow. Apparently, most of the methods are very satisfactory, for the settings of the American-made motion pictures are outstanding. From time to time the methods of these art directors will be discussed, but it seems particularly fitting this month to look into the work of Mr. Max Ree, who received the Academy award last month for his art direction in "Cimarron".

Mr. Ree is a firm advocate of modelling your sets. Every set that he designs is first created in miniature. A glance into his department at RKO-Radio Studios would give the ordinary layman the impression that someone was preparing a Christmas present for a small boy, for there are countless castles, houses, tiny streets, tiny lamp posts and what-not. However, these creations are models for future sets, designed with exacting precision; models over which directors and cameramen ponder in stern reality.

According to Mr. Ree, building your sets in miniature affords a much clearer perception of the requirements of the picture production problems than is afforded by either sketches or drawings. The director and the cameraman can more clearly visualize the action that is to take place. The director can plan out his action with no fear of having his plans go wrong, because he can work this action out practically on the model

sets, and many times discovers that some certain bit of action must be changed because it would not be practical, or would cost far in excess of its worth to the picture.

The cameraman can study the model set and work out his camera angles and decide long in advance upon his lighting sources and effects. Many times vast savings can be brought about because the cameraman and the director can see, practically, that only a small section of a set need be built to furnish the effect desired. The building of a gigantic set, with walls and surfaces of vast extent is an unnecessary waste when only a small portion is to be covered by the camera angles—this can be determined in the model sets to great advantage, and costs can be cut.

Mr. Ree is one of the few art directors who also designs the costumes for the players. He points out that by having his sets in models before him he can more easily decide upon costume and set dressing than can be done by mere sketches or drawings.

Sound, according to Mr. Ree, has been a definite aid in creating atmosphere, and gives the art director a new medium of expression. Only a small corner of a walled courtyard is shown on the screen, but the sound of tramping feet will give an impression that in the old days had to be shown by vast sets and marching soldiers. Thus mood is expressed at much less cost, if intelligently studied and handled.



Mr. Ree with some of his Set Models.

DeSart Joins General Sound

ALBERT W. DeSart, formerly head of the sound department at the Paramount Studios, Hollywood, the sound department which won the Academy award for best sound reproduction of the past year, has now joined the General Sound Corporation of Hollywood, as Director of Sound.

Mr. DeSart has had many years of experience in sound and radio, having been a government radio inspector when the radio was in its infancy. At one time he was district superintendent of the Northern District for the Marconi Company. In commenting upon his connection with General Sound he says:

"Independents will have to give more consideration to recording procedures—It is impossible to get good results with improper acoustical conditions. Improper recording is very costly and 'quickies' today are made so fast that competence and experience are very necessary."

Light Intensity Measured By New Camera Invention

DEVELOPMENT of a new motion picture camera device for measuring light intensities, enabling the cameraman to maintain all exposures no matter how varied may be the lighting conditions, to a constant negative density, has been announced by M. Lasky, inventor, and is being marketed by the Graphometer Corp. of New York.

Light intensities of the device, which is small and compact and adaptable to Bell & Howell or Mitchell cameras, are obtained by direct meter reading and with its use any desired light effect can be gauged before photographing with rapid accuracy. The photographic accuracy of the device, the inventor claims, makes it especially adaptable for color work.

Vallen Curtain Control Has High and Low Speed

A NEW CURTAIN control to be known as the Aero-Speed Control and said to have a curtain speed of 228 feet per minute and a slow speed of 40 feet per minute, as well as operating at any speed between these limits, has been brought out by the Vallen Electrical Co., Akron.

By a simple change of two parts, it is declared a new speed can be obtained and the unit can be used for an entirely different purpose. With the use of this device, huge curtains can be operated by remote control from an electric push-button station which is installed in the most convenient location.

The device is operated by a single push-button, is noiseless, compact and will not coast, the company declares.



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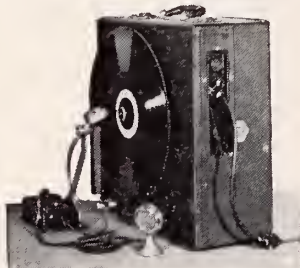
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Keyes Opens Studio

DONALD B. KEYES, well known member of the American Society of Cinematographers, has opened a portrait studio at No. 127 North Larchmont, Hollywood. It is called the Studio of Donald Biddle Keyes, and he has been swamped with business since the opening day. Mr. Keyes, long a motion picture photographer, has always been an outstanding portrait man, having started his picture work as a "still" man. He first introduced the idea of a studio having its own portrait studio.

S. K. Wolf Honored

S. K. WOLF, Director of the Acoustic Consulting Service of S. Electrical Research Products, has been honored by election as a Fellow of the Acoustic Society of America. He has also been appointed a member of the Society's Standardization Committee.

Amateur Movie Making

(Continued from Page 32)

action may be photographed equally well from various angles, when going through the movements required.

Those who have forsaken the still camera for the motion pictures should go back to the former, and use it in addition to advantage as an easy, sure, and inexpensive means of improving the latter and cutting down the waste of uninteresting film footage, which invariably occurs, but can be reduced to a minimum by an adequate study of various photographic conditions.

Principles of Sensitometry

(Continued from Page 28)

are desired but it does not seem probable that sufficient precision can be obtained for standardized sensitometric work.

Another type of intensity scale instrument is that designated as the tube sensitometer which consists of a series of tubes or cells of equal length at one end of which is placed the photographic plate, the other ends of the various tubes being closed by opaque plates containing apertures of variable areas. If these apertures are properly illuminated the intensity of the light acting on the photographic plate at the other end of the tubes will be directly proportional to the areas of the apertures. It is difficult with this type of sensitometer to obtain a very wide range of illumination without having as a result a very cumbersome instrument.

Pictorialists ATTENTION!

Three cash prizes will be given for the three best photographs appearing in the pictorial section of this magazine during the twelve issues from October, 1931, to and including September, 1932

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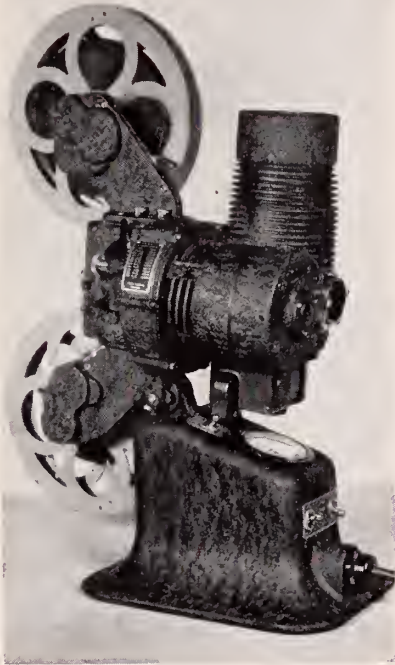
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New Projector From Bell & Howell

A NEW FILMO projector, the Model J, is announced by Bell & Howell. With a picture brilliance asserted to be practically 30% greater than that afforded by even the Filmo 57-GG, it is hailed by its makers as marking "the most outstanding advance in the history of personal movie projection." Life-size movies of theatre quality, it is stated, are easily projected by it in the home, classroom, or auditorium.



The new Filmo Model J Projector

For months, we are informed, engineers have been engaged in perfecting this new projector. Not only are superlative performance and ease of operation claimed for it, but it has a handsome, luxurious appearance and sets a high mark in beauty of line and finish. The Model J is low-built with a large base designed to afford desirable stability, as well as making for beautiful proportions.

The new projector is entirely gear-driven and hence dispenses with all belts and chains. The gears are fully encased. This is asserted to be the first fully gear-driven 16 mm. projector.

The notable increase in picture brilliance, which is said to have been demonstrated in exhaustive tests, has been secured by an improved 375 watt lamp, a new Cooke 2 inch F 1.5 projection lens, improved condenser, a large reflector, and a refined reflector adjustment. And there is a novel light trap whose purpose is to prevent the escape of stray illumination.

The above are only a few of the new and distinctive features of this new projector which, the manufacturers state, is bound to be a sensation in the 16 mm. world. Other important innovations include a completely automatic rewind; airplane type cooling which supplements the well-known Filmo tornado fan cooling system; and an adjustable built-in pilot light, which can be slid back into the base when not needed and which goes on when the projection lamp is turned off, and vice versa. Conveniently spaced and clearly marked controls and switches facilitate operation.

Along with the many new features we are told that "The Model J retains such basic Filmo Projector principles as the nine-to-one side tension film movement mechanism with its automatic framing of steady, flickerless pictures; the powerful direct lighting system controls for reversing and stopping for still projection; and adaptability for Kodacolor."

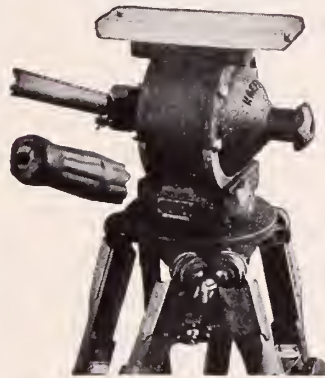
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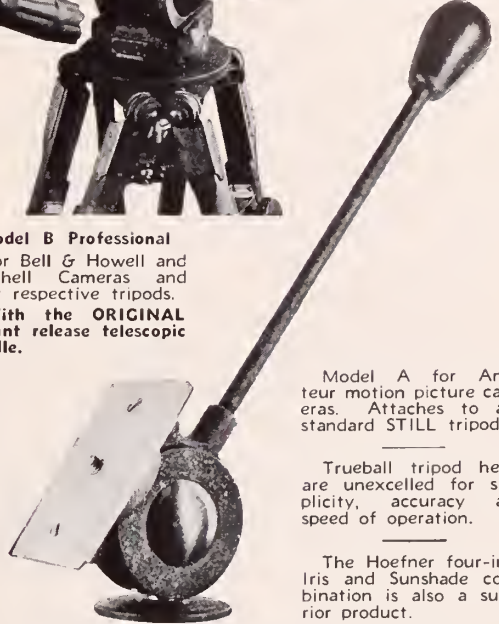
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Auxiliary Parallax Viewfinder for Filmo 75 Cameras



AN AUXILIARY parallax viewfinder for the Model 75 Filmo camera has been developed by the Bell & Howell Co. It is designed to be detachably mounted on the door of the camera at the top.

The new finder affords a much larger image of the picture area (approximately three times) than is given by the regular built-in viewfinder of the 75 camera. It is unusually convenient to use while permitting greater accuracy in close-up work.

The new finder by being mounted at the top of the camera affords the greatest possible convenience to the movie maker. In fact, he can easily use the finder without removing his hat. Its location, of course, places it at some distance from the lens, but a simple and ingenious graduated slide device, placed on a bias, permits of instantaneous compensation, at one operation, for horizontal and vertical offsets. This device is corrected for a range from infinity down to two feet. By setting the slide at the two-foot mark, for example, finder and lens are centered vertically and horizontally at an object two feet away. The new finder is thus particularly important for close-up work, especially for title making.

While the field shown by the new finder is the same as that of a 20 mm. lens, fields of other lenses of longer focal lengths may be etched on the finder face. Of course, the regular built-in finder will continue as a standard feature of the camera, and the camera will still be sold without the new finder if so desired.

The Model 75 Filmo Camera with detachable parallax finder can be had in a special case of distinctive design for those who wish to have the finder permanently attached to the camera door. However, attaching or detaching the finder from its mounting on the camera door is merely a matter of seconds. It slides on a dovetail plate attached to the door.

Those who wish to have their present 75's adapted so as to permit of the use of the new finder need simply have the mounting plate attached to the camera door.



Rockne Shorts for 1,500 Houses

R-K-O-Pathe's series of Knute Rockne football shorts were booked by 1,500 houses to start playing during the first five days of national release, says A. H. Schnitzer, short subject sales manager on Ned E. Depinet's staff. Rockne himself is seen and heard in the six pictures.

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Eliminating Small Producers in the German Field

NUMEROUS notes forwarded to the Bureau of Foreign and Domestic Commerce indicate the gradual demise of the small European producers unable to maintain production under sound film conditions. It is not apparent that this extinction of the so-called mushroom producer has yet to reach its true level, for in Germany during 1930, 44 companies turned out one or two films each, as compared with 61 companies in 1929, 42 in 1928, 62 in 1927, and 60 in 1926. These figures are significant. Though these companies registered lowest numerically in 1928—Germany's peak production year, when only the rankest kind of mushroom producer confined himself to one or two films—61 producers of this category operated during 1929, practically the last year of the silent film era. In 1930, the first year of the sound film era, the number of mushroom producers (44) would appear to indicate that the death knell had not yet been sounded, notwithstanding that this number was 28% under that for the preceding year. It does, however, represent a tremendous decline when it is considered that many of these producers were, in reality, making what will prove to be their last attempt at production, unless Tobis royalties charges are considerably reduced, and that 1931 will see a still smaller number remaining.

Dr. Alexander Jason, who occasionally writes in the German trade press on economic surveys of film production, recently published an article in the French trade press. While his figures as they relate to the number of productions turned out annually do not agree with official statistics that have been previously reported they do substantiate his purpose in showing the decrease of these mushroom producers and in a sense the strangle hold that Tobis is getting on the German film industry. Dr. Jason's article in translated form is submitted below: The department's usual waiver of responsibility accompanies this translation.

Statistical material available on film production in Germany during 1930, the first sound film year, is a very interesting subject to study from various angles.

The change over to sound film obviously necessitated financial sacrifices, especially during the early part of the sound film era, and, owing to entirely new problems and the lack of experience in technical and economic phases, considerable insecurity resulted in the production field.

Today, the situation is entirely different; the foundation of sound film production has been clearly established and the statistical material available in this connection for 1930 can well be taken as a basis for an exact study of the economics of the film situation.

If it is considered that the average production cost of a silent and of a sound film is 175,000 and 275,000 marks, respectively (the latter amount including 175,000 marks actual production costs and 100,000 marks for sound-film royalties), it is easy to estimate the capital spent on film production in Germany during the period from 1926 to 1930, inclusive.

It is, of course, obvious that the production costs of each individual film differ considerably; in fact, they have varied between 20,000 and 2,000,000 marks during the 4-year period from 1926 to 1929, so a very conservative estimate may fix the average production price of a silent film at 175,000 marks. Taking this average cost as a basis the total amount spent on film production during the 5-year period in question was probably as follows: 1926, 185 feature films, total cost 32,375,000 marks; 1927, 242 feature films, total cost 42,350,000 marks; 1928, 224 feature films, total cost 32,200,000 marks; 1929, 183 feature films, total cost 32,025,000 marks; 1930, 146 feature films, total cost 35,550,000. Total 5-year period, 980 feature films, total cost 174,500,000; yearly average 196 feature films; average yearly cost 36,300,00 marks.



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16mm. Contestants Attention

Professional Cinematographers Positively Barred . . . BUT here's a tip to contestants . . . make your 16 mm. efforts rival professional 35 mm. standard production. **1st**, choose good equipment. **2nd**, a subject of perfect facial photographic qualities. **3rd**, Panchromatic film AND PANCROSCOPIC "SILVERLEAF" REFLECTORS (for your exteriors) THE "BABY" PANCRO. (for high, head, and side lighting) MAX FACTOR'S 16 mm. MOVIE "MAKE-UP" (used by famous Hollywood film stars . . . ask about FREE TRIAL MAKE-UP KIT) Write for booklet. **SIXTEEN MILLIMETER PRODUCTS** (Dept. W) LYNWOOD, CALIF.

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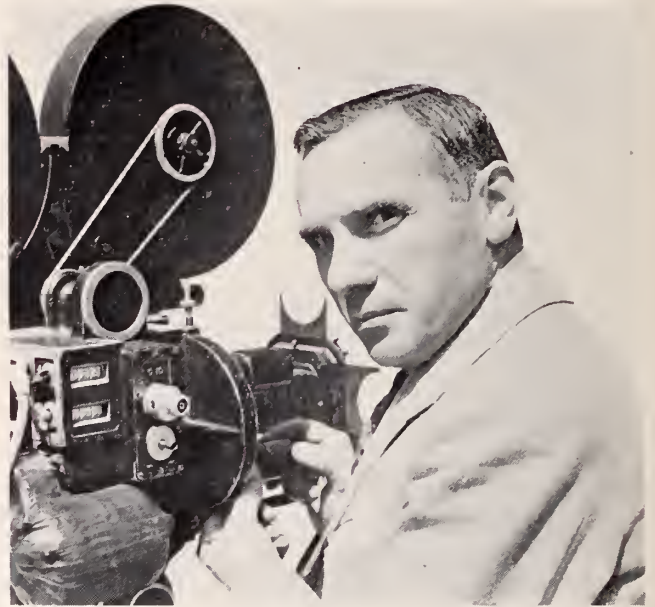
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Good News For Amateurs



ONE of the most outstanding and valuable series of articles ever offered to the Amateur Movie Maker by any magazine, will start in the January issue of the AMERICAN CINEMATOGRAPHER.

This series of articles will be written by a group of the most famous cameramen in the motion picture world; men who photograph the big productions and the big stars; men whose names are familiar wherever pictures are shown. The articles will be helpful and instructive, and no Amateur should miss any of them, for they will include home lighting, use of filters, composition, night photography and other important technical subjects.

The first of the series will be written by Jackson J. Rose, A. S. C., a cameraman who has been photographing big productions and stars for the past twenty years. Hardly a star of any importance who has not acted before the camera of Mr. Rose. Since sound came in we find "Seed", "The Lady Surrenders", "Reckless Living" and "Law and Order" among his pictures. And we all remember the silent pictures, "The Dangerous Age", "Smouldering Fires", "Midnight Sun", "We Americans", "Love Me and the World is Mine". These are a few of his silent pictures. Watch for the first of this great series.

Filmo Topics

ONE of the most interesting publications for amateurs is Filmo Topics, the monthly magazine published by the Bell & Howell Company of Chicago. This magazine is sent free if you send your request to Bell & Howell. The December issue contains many useful items, among them are the following:

Your Christmas Day Movie. Let these suggestions help you do justice in filming your 1931 Christmas activities, which will assuredly merit a little extra effort on the part of the cameraman.

If a Filmo Camera Could Talk . . . This is what it would say on a trip to Mexico.

Titling Your Films. No. 12. Clever animated titles—the revolving reel, fade-in and fade-out, a trade mark a la M-G-M.

Victor Issues Special Instructions For Making Titles With Victor Cameras

THE VICTOR Animatograph Corporation, Davenport, Iowa, has recently prepared, and is issuing on request, a 9½ x 11" blue print containing explicit instructions for setting up Victor Cameras for title making, either with or without a title board.

The instructions cover four sizes of title cards, ranging from 5½ x 7" to 12 x 15". They show the exact distances at which the cards should be placed from the camera, and give instructions for centering the titles and for securing a sharp focus.

Owners of Victor Cameras interested in title making may secure copies of these blue prints by addressing the Victor Animatograph Corporation, Davenport, Iowa.

Babbling About Brittany

(Continued from Page 36)

mits, and they live always in danger of having their homes swept into the sea by one of the great periodic tidal waves.

1896-1897 was a most disastrous year, they had to seal up their cottages and remain inside the tempests were so severe and the seas so high, the light house was destroyed and the inhabitants barely escaped wholesale death by starvation.

There are people who were born there, who have never left this little place, and to whom therefore even a tree is unknown except it may be through a picture, for there are neither trees nor shrubs on this spot, which seems truly God-forsaken.

Yet human beings live there. Why they do so when they could go to the mainland seems hard to say. They were born there. While the land is barren and hard the fish provide a rich and splendid harvest, and in a world where it is hard enough to make a living they feel "it is better to endure the ills they know than fly to others that they know not of".

Of such is composed the land of Brittany and the Bretons. Colorful. Different. Interesting. Hospitable. Old-world still. Charming.

And I find with reluctance and regret that I have finished my babbling, that my last chapter of rambling chatter is at an end, and I hope those who have seen these places, met these people, find I have set them down just as they are, and that in reading they may renew in some of them their own happy experiences, and that I may have excited the curiosity of others who have never been there, to take a chance and go.

If they do they will ever after have a friendly feeling towards me for having so persuaded them, for I do believe that nowhere else can you find more of old world interest and yet modern comfort as far as food and lodging are concerned, than in this lovely province.

Have I bought back all there is to tell; that is, all there is worth while? Not a hundredth part. Have I brought back only the best? There is no "best" where all is interesting, and I have only scratched the surface of places that should be seen.

Go and forage them out for yourself.

Go, as I said at the beginning, without prejudices.

You will have to take everything with a strong percentage of religion, but though you may smile indulgently at their old fashioned faith, their complete acceptance of things that to you seem absurd, you will finally come away with a good deal of respect for a religion that comforts, upholds and sustains these lovely peasant and fisher folk.

A very great scientist once said: "I have studied for fifty years, and after all I have only arrived at the faith of a Brittany peasant".

Classified Advertising

Rates: Four cents a word. Minimum charge, one dollar per insertion.

POSITIONS WANTED

POSITION WANTED—Young man, 20, good knowledge cinematography, wishes connection with capable cinematographer. Now using DeBrie. George W. Hesse, 125 St. Nicholas Ave., Brooklyn, New York.

WANTED—MOTION PICTURE CAMERAS

WANTED—Motor for Akeley, complete with motor attachments. Miller, Apartado 945, Havana, Cuba.

WANTED—For cash, DeBrie, Pathe, Bell & Howell Standard cameras. Send full description. Bass Camera Company, 179 West Madison Street, Chicago.

FOR SALE—CAMERAS

FOR SALE—Complete Mitchell Camera. Latest equipment, bargain. Ries Bros. Inc., 1540 N. Cahuenga, Hollywood, Calif. Phone GR-1185.

FOR SALE—Complete Akeley Camera. Bargain. Ries Bros. Inc., 1540 N. Cahuenga, Hollywood, Calif. Phone GR-1185.

FOR SALE—DeVry, just made two Universal Newsreel pictures, and 6 x 13 cm. Gaumont f 4.5 stereo, best offer. Want Eyemo, or Akeley lenses. Eddie, care A. Cinematographer.

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FOR SALE OR RENT—First Class Akeley Outfit complete. Phone GR-4274, or write Dan B. Clark, A. S. C. office.

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FOR RENT—Mitchell Camera Outfits for Sound. All accessories available. Ries Bros. Inc., 1540 N. Cahuenga. Phone GR-1185. Open till 9 P. M. Residence phone HO-1055.

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Dear George:

My trip to the Arctic this summer with Donald B. MacMillan was a great one, and I want to tell you how well your camera behaved on what I figure was about the toughest trip a camera could go through. In twelve weeks along the North Atlantic we only had thirteen days of sunshine, the rest was storms and fogs and salt water over everything.

We lugged that camera in an airplane all over the mountains, we packed it all over these mountains and glaciers of Baffinland and Labrador, on deck the Schooner Bowdoin in all kinds of weather, hunting walrus and seals with the Eskimoes in little boats, and sorry to say very seldom did it ever get put away in its case, for we had to eliminate weight so occasionally rolled it up in a blanket.

I had spare parts along with me but never needed them. The weather acted on the leather belts and many serious buckles would have happened had it not been for your little trip which cut the motor at the right time.

Something like thirty thousand feet of Multi-Color Du-Pack as well as the Black and White was run through it without any mechanical trouble at all and on the screen it was as sharp as could be and everyone well pleased with the results.

Auch - In - I.

ESKIMO

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